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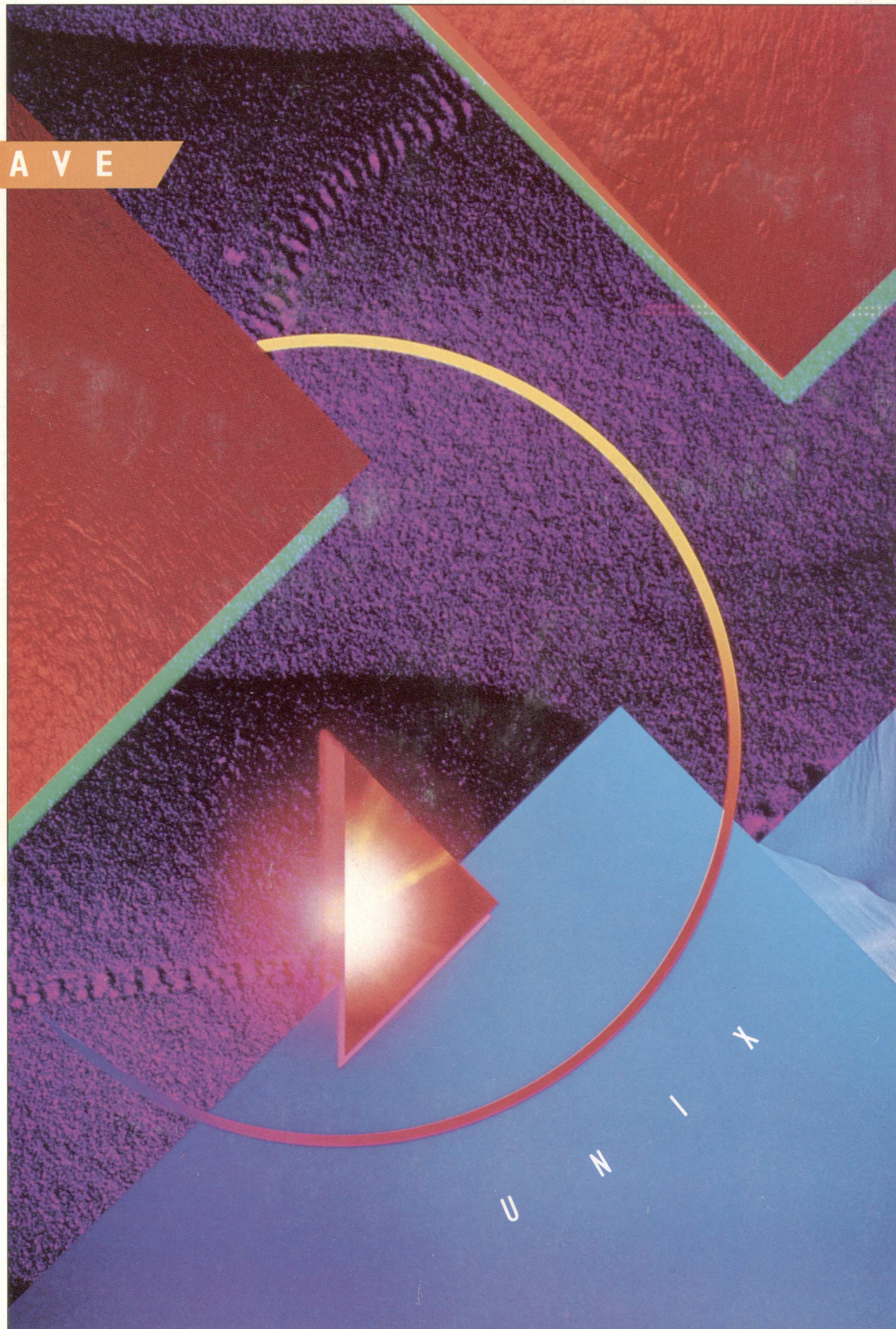
THE INDEPENDENT MAGAZINE FOR NEWWAVE COMPUTING ▲ VOL.5 NO.1

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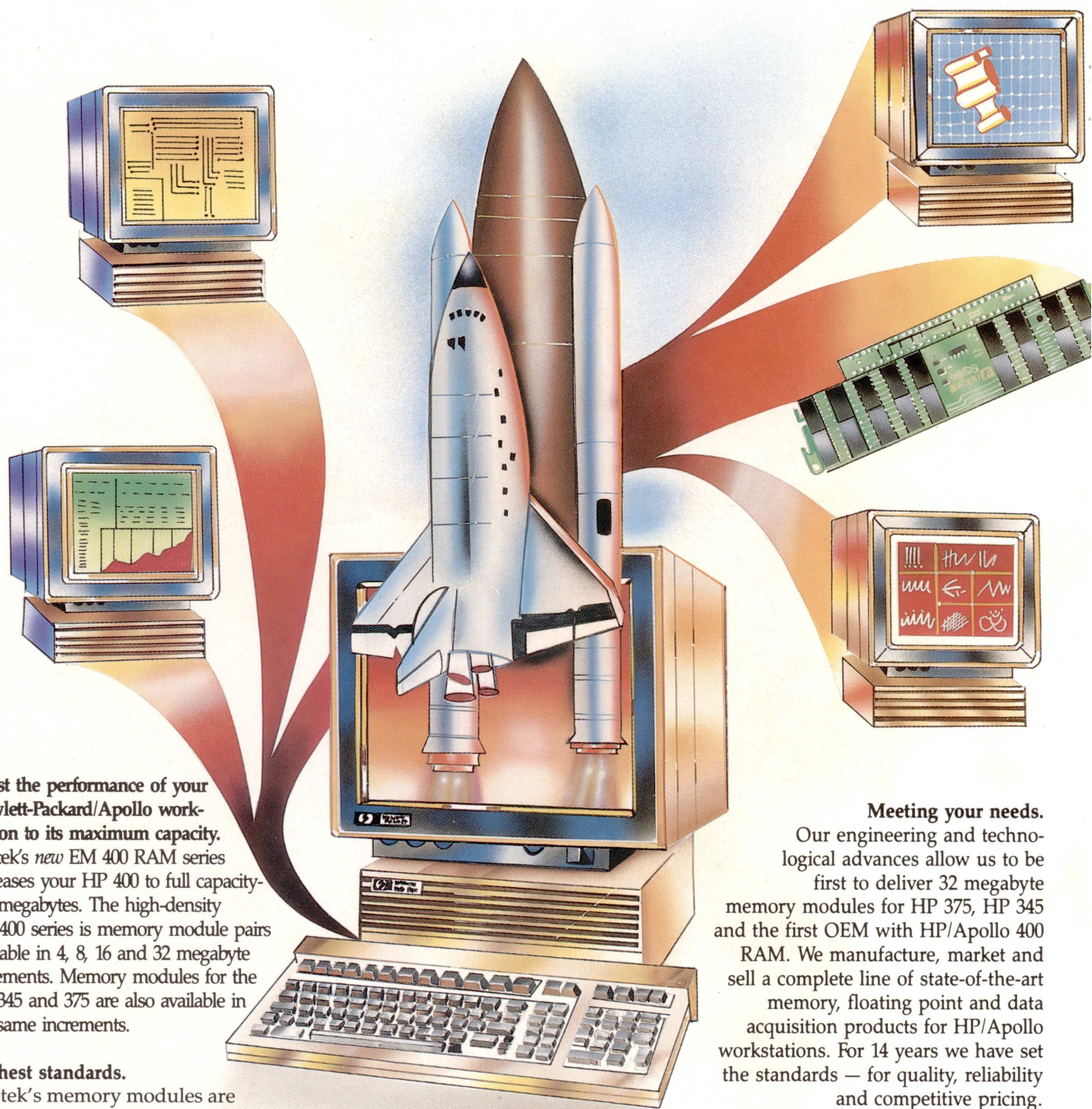
NEW WAVE

HP-UX And Beyond . . .

- ▶ In A Year
That Slumped,
UNIX Sparkled
- ▶ Will OSF/1
Change The Way
You Operate?
- ▶ HP-UX And MPE:
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- ▶ Don't Worry—
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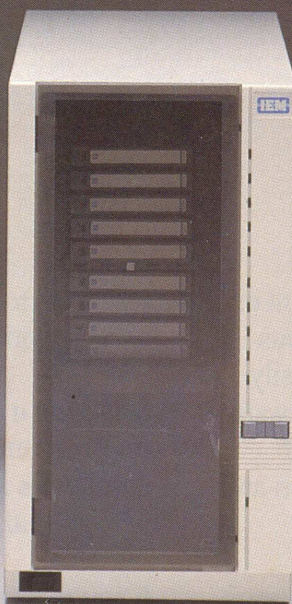
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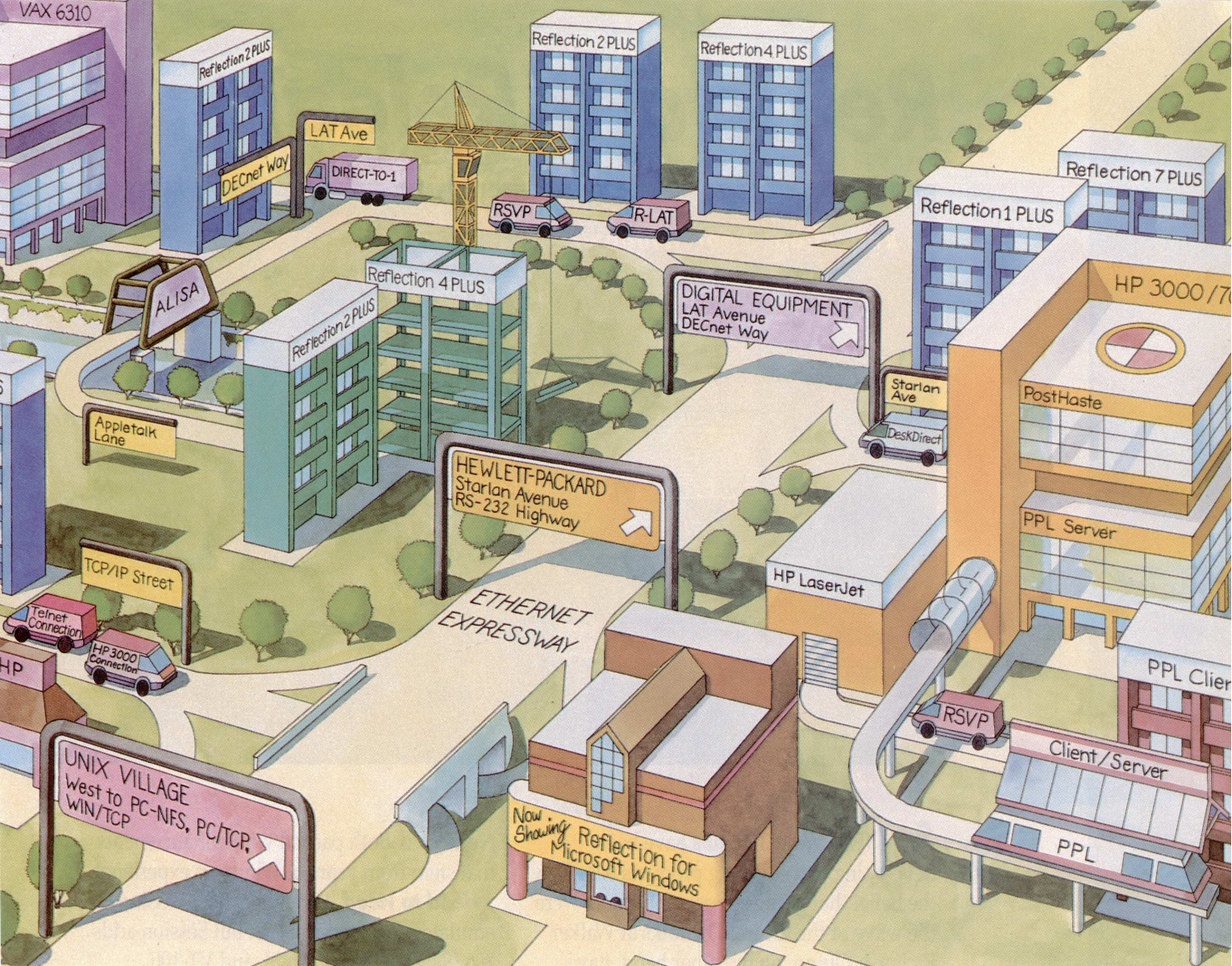
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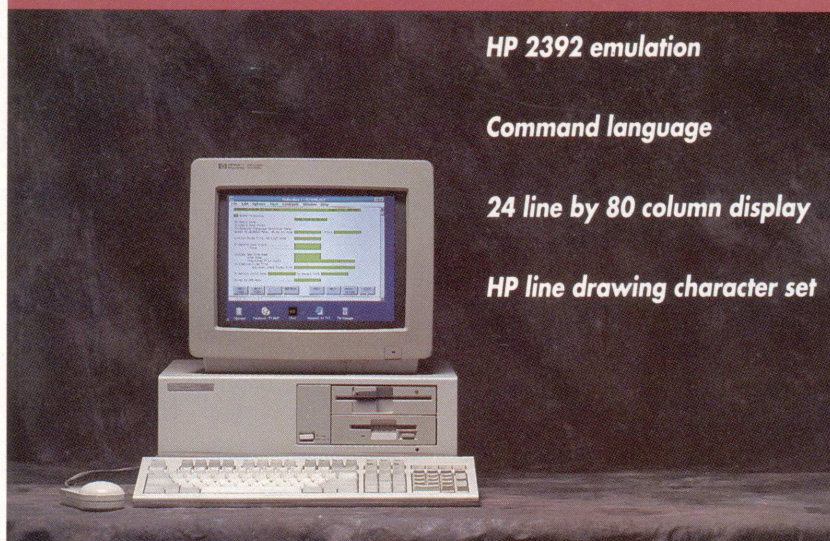
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If you plan to adopt HP's NewWave Computing as your integration strategy, then you should know that Session supports HP NewWave today . . . Reflection doesn't. With Session for New Wave, your users can transfer files or run scripts with a simple drag and drop. Or better yet, they can let their Agents do the work.

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Our NewWave Charter

Until recently, Hewlett-Packard presided over a divided market — commercial systems on one side, technical systems on the other. This schism was reflected right down to the company's organization. The Commercial Systems Division developed and maintained the HP 3000 and MPE; the General Systems Division and the Workstation Group shared responsibility for the HP 9000 and HP-UX. Cooperation between the divisions was limited, and it sometimes seemed that one group didn't have the faintest idea what the other was trying to do.

In the past year, a lot has changed. The company has successfully leveraged its PA-RISC architecture across the HP 3000 and HP 9000 lines, giving HP a degree of architectural consistency across platforms that no other vendor can offer. The HP 9000 and HP-UX have finally taken hold in commercial markets, and the HP 3000 has become the undisputed leader in mini-based OLTP. HP users in the field are exploring opportunities to link these historically separate systems.

More important, the two lines are now united under a single banner. I'm referring, of course, to NewWave Computing. With its NewWave Computing strategy, HP at long last has put forth a way that its commercial and technical systems, as well as the Vectras and newly added HP Apollo systems, can work together to solve business problems.

HP Professional has been following these evolutionary developments for many months. We're encouraged by the progress HP has made toward integrating its diverse offerings. We're excited by the new ideas and visionary thinking NewWave Computing has produced. We're so excited, in fact, that we've changed our tagline. Welcome to *HP Professional, The Independent Magazine For NewWave Computing*.

Make no mistake, NewWave Computing is a tall order. Some consider it visionary, others think it's little more than a marketing fantasy. At *HP Professional*, we think NewWave Computing furnishes at the very least a framework for thinking about HP's commercial and technical markets as a whole. At best, it provides a window on the future of computing.

HP's Joel Birnbaum has called NewWave Computing HP's "technical gamble" to establish leadership in the open systems arena. At *HP Professional*, we've never been afraid to take risks. We're betting our coverage of NewWave Computing will keep you and us on top of the HP market.



Our NewWave Strategy

To keep you apprised of developments in NewWave Computing, HP Professional will bring you a host of new columns and regular features.

Features Focus On NewWave

Beginning with this month's issue, you'll notice that our feature articles look at how technologies available today fit into the NewWave Computing framework. For example, Dan Kaplan's article "Plug In To NewWave" offers an in-depth discussion of HP Sockets, HP's set of software tools designed help you integrate existing MPE- and HP-UX-based applications.

Also in this issue, you'll find an extensive discussion of HP's involvement with standards-based computing in "Open Observations," an interview with Glenn Osaka, HP's liaison to the Open Software Foundation.

Enhanced HP 3000 Coverage

You'll notice, too, that we've added an HP 3000 Editor, John Burke, with a new column, "Managing Your HP 3000." Burke is a 14 year veteran of HP 3000 data center management and knows better than most what the future holds for HP's flagship machines. Regular readers will recognize Burke from his HP 3000 product reviews in our From The Lab section. In his new column, he'll examine closely the ways in which HP plans to integrate the 3000 and MPE into the NewWave Computing environment.

Expanded Apollo Coverage

In coming months, you can look for increased coverage of HP Apollo workstations and the role of Apollo systems and technology in NewWave Computing. Fred Mallett, a member of the Apollo Domain User Society (ADUS) board of directors, joins our staff as a regular Apollo Editor with a bimonthly column beginning in February. We'll also be featuring expanded coverage of Apollo third-party products in our Product Watch and From The Lab sections.

An International Perspective

Throughout 1991, we'll be stepping up our coverage of the global HP market. HP spent much of this year carefully posi-

Continued on next page

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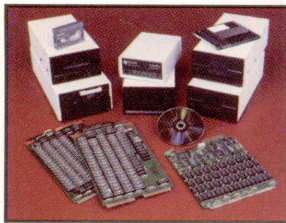
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Continued from previous page

tioning itself for growth in overseas markets. Our new International Editor, Marsha Johnston, will provide regular coverage of HP's activities in Europe and elsewhere. Also, beginning with this issue, we're adding an "International Insights" section to our News and Trends department. The section will highlight new activities of HP and major third-party vendors outside the U.S.

A Fresh Look

Last but not least, you've probably noticed our new look. After months of patient reporting and careful consideration of NewWave Computing, we decided the time was right to let our assessment of the strategy be known. We feel NewWave Computing offers the best means to cover the entire HP market, a task that *HP Professional* has been performing longer than anyone. We also think it provides new insights into ways your HP systems can better serve your information needs, which has always been our goal. Our fresh look mirrors this new thinking.

HP Looks Ahead

With NewWave Computing, HP has articulated a comprehensive strategy of standards-based, multiplatform, client-server computing in a distributed environment.

As the independent magazine for NewWave Computing, we plan to continue bringing you the most comprehensive, highest quality and hardest hitting news coverage in the HP market. We also plan to provide you with in-depth, technical solutions to computing and networking problems you face every day. ■

Now that you've prepared... scheduled...and launched your batch jobs, isn't it time to find out what they're doing?

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TeleScope's monitor commands make batch job communication easy. As a matter of fact, communication is so easy, you'd swear you're communicating with a session, instead of a job. And the TeleScope interface is simple to establish. Just add one communication routine at the beginning of each program within the job. And that's it! From that point, it's easy to determine job or program processing times, job disposition, current phase of a multi-phase job, or gracefully end, suspend, or resume a job.

PROGRAM STATUS

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offers you the flexibility of viewing the contents of a variable or obtaining other vital, up-to-date information. For example, TeleScope could be used to suspend a job in order to perform a backup, then resume that same job once the backup has completed. The possibilities are endless!

PLUS MORE!

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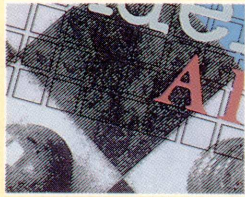
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COMMENTARY

Don Marks

Changing Tides

we're in the midst of a transformation in information technology. That statement may sound like a platitude—change, after all, is the essence of the computer industry. But HP is promising more than just another generation of fast machines. Its NewWave Computing strategy offers a fresh perspective on computing, one that takes for granted—or at least allows the user to take for granted—much of the technology that concerns us today.

NewWave Computing is predicated on the notion that technology should provide users with “a transparent information utility.” According to Joel Birnbaum, head of HP's prestigious Information Architecture Group, the services of this “information utility” must be as obvious, easy-to-use, and pervasive as standard technologies like the automobile or electric power.

New Paradigm

Birnbaum, in his speech at the 1990 Interex conference, indicated the difference between NewWave Computing and traditional data processing solutions. “This new decade,” he said, “will witness the evolution of a new computer paradigm, in which the time-shared mainframes and minicomputers of the 1970s and the proprietary networked systems of the 1980s are replaced by multivendor cooperative computing systems.”

As we've seen in the months since the conference, Birnbaum's speech was more than history mingled with science fiction. It was an assessment of where we've been in computing and a vision of where we can go.

If you listen to HP's plans for the 1990's, you begin to realize

Right now, many vendors recognize the trend toward a seamless, cooperative and distributed computing environment. But HP is the only vendor to adequately outline the dimensions of this paradigm shift.

What Is NewWave Computing?

David Butt, HP's marketing manager for NewWave Computing, defines the strategy as a vision of computing in which “users transparently obtain the services and resources they need from a network of computers behaving as a single integrated whole.”

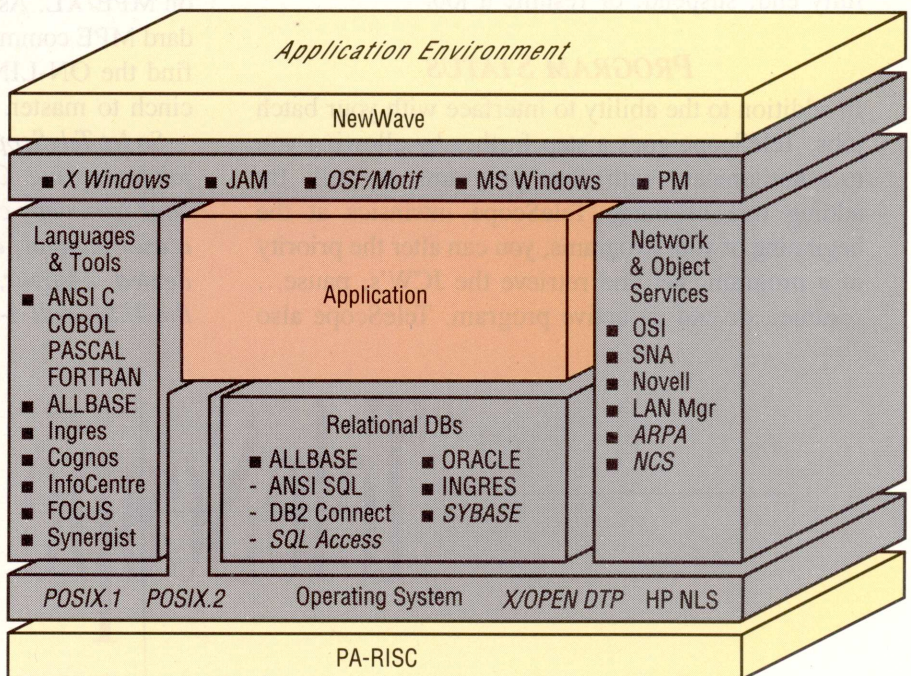
Two key elements for understanding the implications of NewWave Computing can be found in Butt's definition: transparency and networking. The concept of making it easier for ordinary people to access information or employ computing power has been around since the days before “user friendly” became

a cliché. Likewise, the idea of integrating diverse computing technologies and platforms via networking is not new.

What makes for groundbreaking change is the combination of these two elements. If users have transparent access to a powerful network of computers, they can learn to use computing power in new ways instead of learning to use new computers.

According to Birnbaum, HP's NewWave Computing strategy was devised to “differentiate HP in the competitive arena of standards-driving, networked computing.” It's designed to permit “a smooth evolution” from the old way of thinking about data processing—as a service performed by specialists—to a new idea of an information utility easily accessible to all who need it.

But, HP isn't saying we don't need specialists anymore. In fact, in order for the user interface to become simpler, the



Italics = planned during 1990-1991

The HP 3000 open environment for NewWave Computing.

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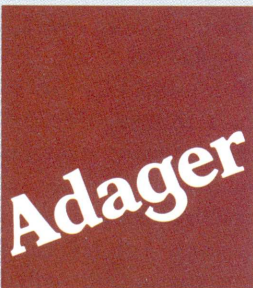
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underlying architecture — the backbone of NewWave Computing — must become significantly more complex.

Birnbaum identifies this as one irony of the new model. “Paradoxically, the new system structures will become much more complicated and disparate than the proprietary ones they replace, but, from the user’s point of view, they must appear simpler and more consistent.”

The degree to which vendors like HP and computing professionals in the field can meet this challenge will determine the degree to which the NewWave cooperative processing environment replaces our existing computing architectures.

NewWave Computing’s Promise

For NewWave Computing to deliver on its promise, users of HP gear must be able to integrate traditionally separate platforms and applications into a seamless, networked environment. According to HP, existing NewWave Computing technology allows HP 3000s, HP 9000s, HP Apollo workstations and PCs to achieve significant levels of interoperability.

Few would dispute this claim for HP’s workstations and UNIX-based systems. The HP 9000 and the HP-UX and OSF/1 operating systems are hailed by industry experts as among the most open systems you can buy. But questions remain about the openness of the HP 3000 and MPE.

In a corporate white paper, “The HP 3000 Open Systems Environment,” the company says future plans for the HP 3000 include “support for Distributed NewWave by providing server-based object management services.” Currently, the HP 3000 supports a range of technologies and applications needed for integration in an open systems, multiplatform environment (see *Figure 1*). “Both the HP 3000 and HP 9000 share a common foundation for standards in networking, relational databases, languages and user interfaces,” the report claims.

Before they give full credence to changes heralded by visionaries like

Birnbaum, most HP users will want to see a higher degree of seamlessness in communications between the HP product lines. In fact, some critics of NewWave Computing say the whole strategy is too vague. They claim it’s long on future plans for integration but short on products deliverable today.

Market Reaction

Industry experts who know the HP market well say the company is on the right track, but the road is difficult. George Hubman, president of Walker Richer & Quinn, agrees with this assessment. “NewWave Computing and the client-server, cooperative processing architecture is where things are going,” says Hubman, “but there is incredible inertia in the development of these types of applications.”

According to Hubman, the success or failure of NewWave Computing won’t hinge on HP’s ability to accurately predict the future, but on whether HP is once again too far ahead of the technology curve.

Right now, it can be difficult to find computing professionals sufficiently skilled to develop truly cooperative applications. “When you start doing client-server applications,” says Hubman, “you’re looking for a programmer who knows both ends of the network—the HP 3000 and the PC, or whatever the case may be.” However, he adds that “programmers looking to the future are developing these skills.”

But Hubman also feels that NewWave Computing and the cooperative processing environment it entails are already having an impact on the computer industry. “To its credit,” he says, “HP is making a very clear statement that PCs on the desktop are the way we’re going to live.”

Cognos’ Robin McNeill shares Hubman’s perspective on the importance of distributed computing. “What makes NewWave Computing possible is a cost-effective server platform.”

McNeill, director of end user products for Cognos, sees a critical shift toward client-server computing in executive in-

formation systems. “Early implementations of client-server computing, the ones where people cut their teeth,” he claims, “are going to be end-user reporting applications.”

McNeill says executive information systems offer an ideal testing ground for NewWave Computing applications. “In a typical application,” he explains, “people would have their production systems on an MPE system and use an HP-UX machine as a report server.” Because end users would access only the report server from their PC or workstation front-end, there would be “no jeopardy to the production application.” But, says McNeill, “We haven’t begun to see what’s going to happen when the report servers are connected to multiple applications.”


NewWave Computing And You

One thing is certain: HP’s innovative investment in distributed client-server networks and enhanced user interface technologies shows a company alive with ideas. The NewWave Computing strategy may be the industry’s only articulation of what computing holds in store for us in the coming decade.

In this sense, HP is doing its installed base a favor once again by going out on a research and development limb. NewWave Computing should protect the investment of current HP users by providing enhanced connectivity across platforms and by opening up proprietary systems like MPE, rather than phasing them out in favor of generic standards.

HP has made clear that its desired goal is a NewWave Computing architecture that allows its various operating systems and hardware platforms—MPE, HP-UX, OSF/1, MS-DOS; HP 3000s, 9000s, 1000s, workstations, and PCs—to work together in a thoroughly distributed, transparent computing environment.

Undoubtedly, real progress towards this goal will involve a variety of complex solutions. For HP to succeed, NewWave Computing will have to guide users of all HP systems through uncharted seas. ■



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INDUSTRY WATCH

Bill Sharp

UNIX-based computers are having these days. Those HP 9000 multiuser and workstation products are doing very well in the commercial market, growing at better than 60 percent! I'm very impressed. By the way, do you know any place nearby where I can unload all this HP 3000 gear? I'd like to avoid having to pay a lot to get it hauled off. I was thinking that if it was crunched up small enough they could mix it into asphalt paving." —I. Ben Hadd, ex-3000 user.

Don't Be Deceived

Hear from anybody like that lately? Maybe it was me. I've had doubts about the HP 3000 from time to time, and I'm not very good at hiding my feelings about proprietary operating systems like MPE. But the fact is that the 3000 is far from the scrap heap, at least according to new numbers, charts and heaps of paper that have come my way from Cupertino, CA, home of that sometimes maligned mini.

You get this message with crystalline clarity from Rich Sevcik, general manager of HP's Commercial Systems Division. He has strong opinions about the HP 3000 systems his division produces. "When you see the next numbers on market share, you will see that HP has significantly increased its share in comparison with its competitors," he says. "The 3000 is the number one mini in the U.S., if not in the world. We're learning how to take our message out to the world, to the average user and to the Fortune 500 and 1000 top execs and DP managers."

"Gosh, it sure is neat to hear about all the success that HP's

Linda Lazor, marketing manager for Sevcik's division, provided an indication of how fast HP 3000 sales are growing (after persistent journalistic whimpering overcame her resistance). "We are still seeing growth over last year in double digits, low double digits for the 3000," she said. "We are definitely gaining ground on IBM and DEC. They are trying to react to hold market position. HP is leading with things they are forced to respond to."

dards based than many people realize. It runs on the same platform as UNIX, uses the same networking compilers and database, and embraces emerging standards such as the SQL environment and NewWave Computing. We already have indicated we would support X Windows and POSIX.

"With MPE, we are able to go with POSIX straight to the kernel of the operating system, on top of RISC architecture, and gain the benefits of MPE in our

Some 30 percent of current HP 3000 sales are to new customers, not just the same old folks buying the same old stuff.

Sales are following along with opinion, she says. Even in the mainframe class, now within the reach of high-end HP 3000 Model 980 systems, "We have much more credibility than we did six months or a year ago," she explains. Lazor reports that both Gates McDonald and LA Gear are moving mainframe applications from IBM to HP 3000 products. Some 30 percent of current 3000 sales are to new customers, not just the same old folks buying the same old stuff.

MPE Is Open For Business

HP even takes issue with remarks about the lack of openness in its proprietary MPE operating system. In his interview with *HP Professional* editors, HP CEO John Young noted, "MPE is more stan-

OLTP environment. So, we're providing the performance of MPE XL in an OLTP environment with a programmatic interface to UNIX.

"Programs written to POSIX on MPE XL can run on other UNIX machines in the future. This really makes it an open systems offering and fits well in our NewWave Computing strategy."

Janet Garcia, product marketing manager for open systems and servers with HP's Commercial Systems Division, says, HP "wants to provide access to open systems without making users buy new hardware.

"HP will extend key MPE commands with the use of POSIX capabilities." She

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said HP will work with third parties integrating POSIX in 1991, with the first application solutions appearing near the end of the year.

MPE folks are moving to provide other links as well. MPE provides PC integration through Novell Netware and

LAN Manager X as well as Apple's MacLink. MPE will support HP Apollo's NCS for networked computing and OSF's DCE standard for remote procedure calls.

But when you walk right up and look closely, the picture for the HP 3000/MPE

market still seems a bit fuzzy. An HP chart derived from information published by the Gartner Group, (Stamford CT), shows leading computer architectures rated for openness. HP 9000 HP-UX systems came out on top (74), with DEC ULTRIX lagging back (65), and HP 3000, IBM RIOS and DEC VAX all vying for third place with identical scores (60). If HP is making headway in the market versus IBM and DEC, it must involve more than operating system openness.

The Virtue Of Simplicity

HP has a slide comparing hardware reliability of complex and simple systems. It shows the IBM 3090 at the high end of the complexity axis, with hundreds of chips used to implement a CPU requiring liquid cooling and exotic thermal conduction module packaging—all costly solutions that can create reliability problems. DEC's VAX 9000 is less complex for the same performance, using many chips in the CPU with exotic packaging and air cooling. HP's 3000 Model 980 provides equivalent performance with a single-chip CPU, simple packaging and modest air cooling.

Cooling requirements track power consumption in these charts, as you would expect. The 3090 requires heat dissipation of 75.7 to 139.7 Kbtu/hr, compared to 53 to 71 Kbtu/hr for the VAX 9000 and 7.9 Kbtu/hr for the 980. Hardware support costs for the 980 are about one-third that of the others, claims HP. Marketing Manager Lazor says customers are able to justify the switch to HP's RISC-based systems on the basis of cost of ownership alone.

So, says HP, expect a substantial future for the 3000 family and a gradual evolution to new capabilities for MPE.

Learning that the 3000 has substantial life ahead of it is news I find personally comforting, because disposal options for kaput computers are definitely limited. A local paving contractor tells me that ground up glass or rubber may be added to asphalt in certain amounts, but crunched computers are out of the question. ■

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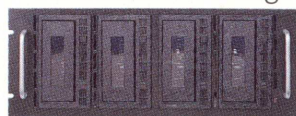
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IXI Limited Announces X.desktop Software Initiative

Aimed At UNIX Software Vendors

IXI Limited announced the X.desktop Software Initiative program. Aimed at UNIX software vendors, the two-phase program has been created to ensure that major UNIX software applications take full advantage of the advanced object management functionality of IXI's OSF/Motif compliant desktop manager, X.desktop.

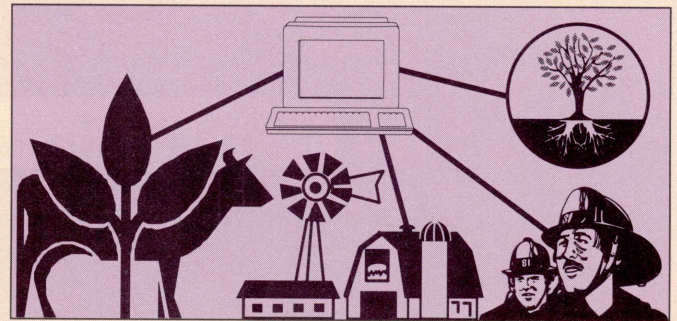
The following companies have already joined the program: Altered Image, Applix, Ashton-Tate, Crosswind Technologies, Empress, FourGen Software, Frame Technology, Informix,

Ingres, Island Graphics, Lotus, Oracle, Quadratron, Uniplex and WordPerfect.

X.desktop is available for the HP 9000 300/400/800 series systems. The new release of X.desktop, X.desktop 3.0, includes new object-oriented technology allowing software vendors to write applications that can interact with the desktop through intelligent "drop" action behavior.

Contact ISI Limited, 62-74 Burleigh St., Cambridge CB1 1OJ, England; 011-44-223-462131.

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Terra-Mar And HP Sign Image-Processing Software Agreement

Workstation Version Of IDIMS Available On HP Imaging Workstations

Hewlett-Packard and Terra-Mar Resource Information Services (Mountain View, CA) announced an agreement to provide Terra-Mar Interactive Digital Image Manipulation System (IDIMS) software on HP and HP Apollo imaging workstations.

The agreement is expected to generate revenue of approximately \$10 million for HP over two years.

HP's imaging workstations consist of HP Apollo 9000 Model 433s or HP 9000 Model 375 workstations and a VITec-50 image-processing board set from Visual Information Technologies (VITec; Plano, TX).

Other characteristics of IDIMS include: menu-driven command capability; a full range of image-processing functions; advanced algo-

rithms; network concepts; I/O system; and more.

Terra-Mar IDIMS software running on the HP imaging workstations will provide five to 50 times the original performance of the IDIMS algorithms. Some specific benefits to IDIMS software users include: the ability to pinpoint crop maturity, identify diseased trees, detect overwatering in cities in which water is in short supply, assess fireprone areas and correct inaccuracies in mapping by overlaying satellite information with current maps.

The product will be marketed to: government agencies with needs for resource planning and intelligence applications; as well as oil and mineral companies conducting exploration and reclamation activities.

Abacus Software Becomes HP Value-Added Business

HP To Market Public Health Solutions

Abacus Software Inc. (Clearwater, FL) has signed a value-added business agreement with HP, in which HP will market Abacus' management-information solutions designed for health and human services.

Abacus provides solutions for public health, community mental health and substances

abuse agencies, psychiatric hospitals, mental retardation centers and organizations that provide crises intervention and hotline referral services. Abacus software products, which run on HP 9000 Series 800 computers using HP-UX, include Client Information, Financial Accounting and Information and Referral applications.



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DECstation 2100/3100	SPARC 330 SPARC 370	9000/350 DN4000	IBM
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Information Builders Demonstrates FOCUS For UNIX

*Multivendor Distributed Network
Highlighted At UNIX Expo*

At UNIX Expo in New York, Information Builders showcased UNIX-based products and capabilities for FOCUS, a 4GL for application development and end-user computing. Highlighting the display was a multivendor distributed network integrating the latest FOCUS for UNIX offerings.

FOCUS seamlessly integrates application development, reporting and decision support tools with a database management system in a window-based environment for ease of use. Applications are portable between FOCUS for UNIX and versions for MPE XL, VAX/VMS, IBM mainframes and AS/400 systems, as well as DOS-, OS/2- and LAN-based microcomputers.

The FOCUS for UNIX network demonstration was

based on a contemporary commercial computing environment featuring a variety of hardware and software, including a DECstation 3100, IBM RS/6000, an Intel 80386-based PC running UNIX system V, Release 4 (SVR4), a Sun SPARCstation, the FOCUS DBMS and several RDBMSs. The demonstration featured distributed data access and integration across the network and provided a platform for the introduction of three new products:

- FOCUS for UNIX graphical user interface.
- FOCUS for DEC ULTRIX/SQL read/write interface.
- FOCUS for INTEL UNIX SVR4.

Contact Information Builders Inc., 1250 Broadway, New York, NY 10001; (212) 736-4433.

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HP Wins Contract From Stone Container Corp.

60 HP 3000s Included In Acquisition

Hewlett-Packard has received a contract for 60 of its HP 3000 Series 922LX computer systems from Stone Container Corp. (Chicago, IL).

The contract totals approximately \$4 million in RISC-based computer hardware and related support products.

Stone Container is a

manufacturer of commodity paper and paper packing products. The computer systems will support Stone's expanding operations by linking remote sites to corporate headquarters and upgrading existing computer systems at newly acquired companies to the HP-based systems.

Infocentre Beta Tests SpeedWare Version 6.0

Infocentre Corp., an international developer and supplier of software systems is currently beta-testing the REACTOR component of its SPEEDWARE Environment Version 6.0 with companies in Canada and the U.S. SPEEDWARE is a fourth generation programming language that runs in mainframe, mini and microcomputer systems.

The two beta sites include American Home Shield (Santa Rosa, CA) and S&C Electronic (Toronto). Using REACTOR, Infocentre's non-procedural fourth generation language, both corporations have developed their own applications in these areas: production planning, accounting, inventory, estimating, telemarketing customer service and customer accounts.

Contact Infocentre Corp., 7420 Airport Rd., Suite 201, Mississauga, Ontario, Canada L4T 4E5; (416) 678-1841.

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SD&G And Cognos Expand Partnership

*PowerPlay United With BUSINESS/XL
Financial Management Applications*

Smith, Dennis & Gaylord (SD&G) and Cognos Corp. reached a partnership agreement whereby SD&G will incorporate Cognos' PowerPlay into its BUSINESS/XL Financial Management applications. The union of these two products will serve to create software with built-in Executive Information Systems capabilities.

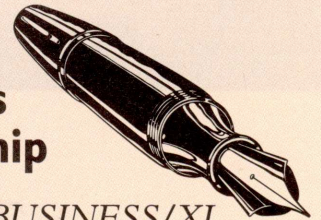
SD&G has developed specialized software that enables PowerPlay to work with the BUSINESS/XL financial software. This is one element of the product offering that will be marketed as BUSINESS/XL Dimensions.

BUSINESS/XL Project

Accounting Solution enables any organization to capture analyze and report costs and revenue of a project on any level. The project data is time-phased and includes budget, commitment and unit data. BUSINESS/XL Dimensions enables project managers or executives to point and click through project information even if they aren't familiar with the BUSINESS/XL Project Accounting system.

Contact Smith, Dennis & Gaylord, Inc., 3211 Scott Blvd., Santa Clara, CA 95054-3078; (408) 727-1870.

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MH&Co. is not the cheapest. Nor the biggest. *Simply, the best.* So if you are going to spend the next ten years with your financial software, which would you prefer: a bargain or the best?

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Optical-File Interchange Standard Under Development

HP Announces Participation

HP announced its participation in developing a standard format for file interchange on write-once and rewritable optical drives. The American National Standards Institute (ANSI) has accredited a 12-member committee, X3B11.1, to produce the standard.

Because of its high storage capacity and removability,

optical technology is efficient for transferring large amounts of data, between UNIX and VMS, for example. At present, however, optical technologies lack a file-format standard to allow easy data interchange between various host operating systems and architectures. HP's implementation of the proposed format is called Optical Systems Architecture.

Premier Solutions Providers Sign Marketing Agreement

Three Companies To Provide Process Manufacturing Solution

HP announced that three of its Premier Solutions Provider software companies entered into a joint marketing and development agreement to provide a comprehensive process manufacturing solution.

Q-CIM Development Laboratories Inc. (Princeton, NJ, and Pleasanton, CA), Collier-Jackson Inc. (Tampa, FL) and Revere Technology (Birmingham, AL) formed the partnership, CIM CONSORTIUM. Q-CIM will provide the order management, manufacturing and distribution modules; Collier-Jackson will provide the financial applications and Revere will provide the maintenance management functionality.

The CIM CONSORTIUM can provide an entire plant-level system, integrating their

"best in class" solutions to provide a premium application set. The agreement is in response to customer needs for greater integration and functionality at the plant level.

All three applications run on the HP 3000 under the MPE XL operating system and are in native mode on the RISC-based HP 3000 Series 900. The applications are written in COBOL and use the IMAGE database.

The stated technology direction is toward standards, open systems and relational databases using existing COBOL code. The suppliers have current projects under way to move to relational database technology, and to move their applications to the UNIX environment under HP-UX, again using existing code.

For Your Information

■ Vantage Technologies provides data recovery engineering and consulting services for damaged computer disk and media tape. Data recovery services are available 24 hours a day, seven days per week. (603) 429-3019.

■ The United States Intelligence Community proposed a standard for CD-ROM read-only data exchange that's designed to facilitate the interoperability of CD-ROM databases among all operating systems. CD-ROM drives, access/retrieval programs and user interfaces. The Information Handling Committee (IHC) of the Intelligence Community will develop the proposed standard.

■ ORBiT Software opened an office in Spain, which will provide sales and support of its BACKUP/3000 product

family. The address is: ORBiT Software (Espana) S.A., Capitan Arenas, 13-15, E-08034 Barcelona, Spain; phone 34-3-280.32.54.

■ Security Dynamics Inc. (SDI) announced an agreement with Dialogica EDV-Dialog-Systems of Munich, Germany. Dialogica will distribute Security Dynamics computer security products throughout Germany.

■ Exabyte Corp., makers of 8mm storage devices opened a European sales and technical support office in Houten, The Netherlands, and a service/repair depot in Cumberland, Scotland. For more information about The Netherlands office, call 31 3403 51347. To make arrangements for service/repair call (303) 447-7578 or toll-free from Europe 08 008 96082.

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Calendar Events

3/18-20: The Sixth International Conference on Multimedia and CD-ROM will be held at the San Jose Convention Center, San Jose, CA. Call (203) 964-8287.

3/26-28: The National Database Exposition and Conference (DB/EXPO) will be held at the Moscone Convention Center, San Francisco, CA. Call (800) 2-DB-EXPO or (415) 941-8440.

4/22-25: The 12th Annual Conference and Exposition sponsored by NCGA will be held at McCormick Place North, Chicago, IL. Call Sharon Sutton, (703) 698-9600.

5/8-10: DesCon will sponsor The Twelfth International Computer Management Show for the Design and Construction Industry, (A/E/C Systems '91). Washington Convention Center, Washington, DC. Call Sharon Price, (800) 451-1196.

5/13-16: The Fifth HP User Group Conference for the South Pacific and Asian region will be held in Melbourne, Australia. Call Mandy Bromilow (613) 429-4322.

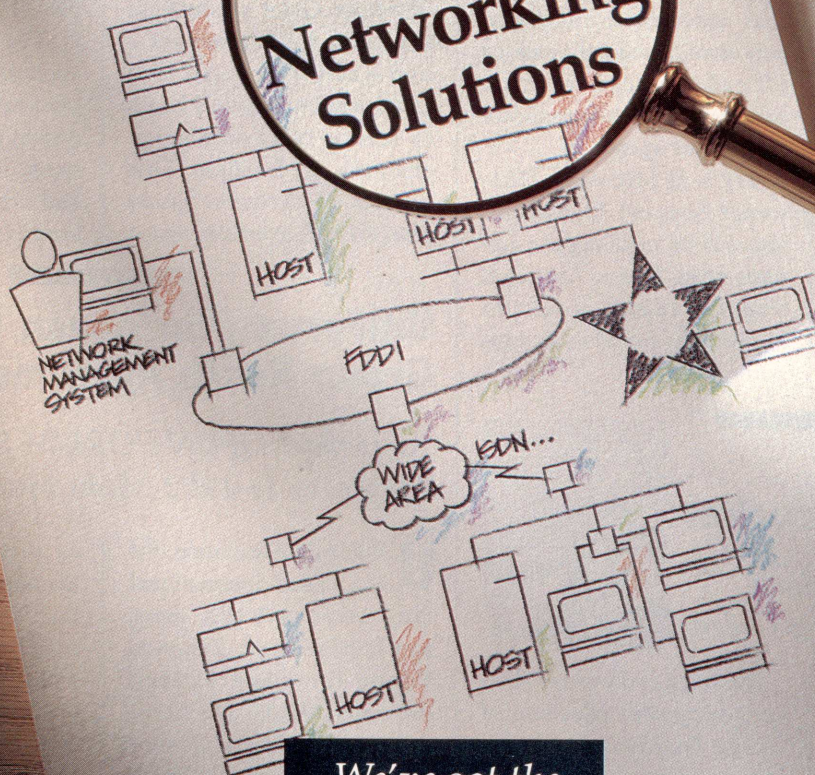
6/11-14: NECRUG will hold its Twelfth Annual Eastern American HP Users Conference at Trop World Hotel and Casino in Atlantic City, NJ. Call Randy Kaufheil, (215) 251-0736.

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From bridges and routers to terminal servers and network controllers, Gandalf has the solutions and products that will tie it all together. And, though we're at the leading edge with products like our ISDN gate-

way, we know that the best solution is a cost-effective and reliable solution.

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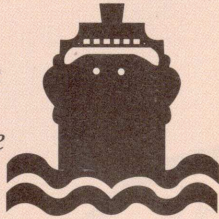
CIRCLE 102 ON READER CARD

See Us At ComNet, Ramada Booth C;
And Network, Booth 4301

International Insights

HP Ships HP 3000s And 9000s Worldwide

Systems To Enhance Performance And Consolidate Operations



Hewlett-Packard announced worldwide volume shipments of its mainframe-class computers, the HP 3000 Series 980/100 and HP 9000 Model 870S/100.

The following customers were among the first to receive their high-end systems: Telecom Australia, Natrel/Aagropur and BASF Canada, Camif-91 Nicort and CNET (France), Secretaria de Hacienda y Credito (Mexico), Cevan (Netherlands), and University of Loughborough, Consumers Association and

Van Den Berghs (United Kingdom).

HP customers will use these systems to create new database server applications that meet their increased performance requirements, to offload applications from mainframes or to consolidate data center operations.

HP's Worldwide Customer Support Operations also will be installing the systems at its North American response centers to ensure immediate worldwide support.

HP CAD Sales Continue To Skyrocket

Company Reports Significant Progress In Closing Larger Orders



Daratech Inc. reported that in 1990 HP chalked up a 25 percent growth on CAD/CAM, CAE revenues of \$375 million with its ME10 and ME30, particularly in Europe and Japan where these mechanical design systems continue to increase in popularity.

For the first time, HP reports significant progress in closing larger orders. While most of the company's largest CAD/CAM installations are in Europe and Japan, some U.S. customer sites now have 60 or more seats, according to Daratech.

In large accounts, HP's very successful Mechanical Design Division, which develops and markets ME10 and ME30, now has a dedicated sales force, and this should help it close more large sales in the 50- to 100-seat range. HP also plans to dedicate individual salespeople to winning certification for HP systems at major accounts, which until now had not been done.

Contact Daratech Inc., 140 Sixth St., Cambridge, MA 02142; (617) 354-2339.

Circle 371 on reader card

Octel And HP Alter European Voice Processing Plans

Distribution Channels To Expand

Octel Communications Corp and HP announced a change in their approach to the emerging European voice processing market.

HP will continue to distribute Octel products in the United Kingdom on a non-exclusive basis, and Octel will immediately begin to develop other distribution channels in Europe. This amends an exclusive European OEM Agreement signed

by the two companies in August 1988.

Octel also will begin selling its new Sierra multiple-application voice processing platform to European VIS providers.

The new Sierra multiple-application voice processing platform is a large capacity system designed to meet the needs of telephone companies and other voice information service providers.

UniForum, European UNIX Users Group Reach Agreement

Amsterdam OPEN FORUM Show And Conference In 1992 Marks First Joint Venture

UniForum Association, the U.S.-based international association of UNIX users, and EurOpen, the European Forum for Open Systems (formerly EUUG, the European UNIX Users Group) agreed to work together in these areas of common interest:

- Co-sponsor a joint European show and conference in Amsterdam, October 1992.
- Cooperate in the area of publications related to the UNIX and open system communities.
- Cooperate to prepare concerted contributions to international standards bodies on matters relating to UNIX and open systems.

The goals of EurOpen are

to promote and advance knowledge, use and application of open computer systems using compatibility techniques pioneered by the UNIX operating system; facilitate the exchange of information and views on use and development of open systems; inform users on the subject of open systems; provide a focus for the standardization of techniques used in open systems; and encourage internationalization of open systems for the benefit of users of such systems.

Contact UniForum, 2901 Tasman Dr., Suite 201, Santa Clara, CA 95054; (408) 986-8840.

Circle 370 on reader card



A New Window of Opportunity

The backlog of work in most DP shops never ends. Users demand faster, more flexible access to data and applications that are easier to use. We can help.

With OmniWindow, your users can find just about anything they need, anywhere, anytime. They can have the retrieval power and flexibility of Omnidex within existing application programs — with no code changes.

Wouldn't users love it if, in seconds, they

could hop out of Order Entry, verify inventory status or customer credit, and return to Order Entry right where they left off?

With OmniWindow, they can. OmniWindow features a natural and intuitive PC-like interface, and runs on standard HP terminals.

OmniWindow may not eliminate your backlog, but it can sure help you to reduce it. Give yourself a breather by opening a new window — OmniWindow.

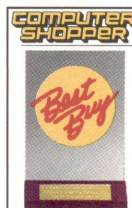


Dynamic Information Systems Corporation 910 Fifteenth Street, Suite 640 Denver, Colorado 80202
For more information, call 303 893-0335.

CIRCLE 113 ON READER CARD

Northgate® Elegance™...

The industry's highest rated 386™ and 486™ systems!



When we say Northgate manufactures the highest-performing, best-supported computer systems in the world ... it's a fact. Industry experts and customers worldwide agree!

In test after test, Northgate Elegance systems perform flawlessly. After the competition has been put through the same demanding paces, only Elegance 386 and 486 emerge as the winners.

And here's the proof! Northgate has won four *PC Magazine* Editors' Choice Awards, two *Computer Shopper* Best Buy Awards and received *InfoWorld's* Number One and Number Two Products of 1989.

PLUS AT PRESS TIME ... Northgate received word from *Computer Shopper* that Elegance 486/25i won a 1990 Best Buy Award. That makes an unprecedented **FOUR YEARS IN A ROW** Northgate received *Computer Shopper's* prestigious honor!

We'd be fooling ourselves (and underestimating you) if we thought you'd buy based on performance alone. That's why Northgate has a corporate commitment to customer service that's equally impressive. No puffery here...

"...Northgate stops at nothing to please its customers." *PC Magazine* September 25, 1990

- ◆ Free delivery to your office or home.
- ◆ **NEW 60-Day No-Risk Trial!** To serve you better, Northgate has doubled its No-Risk Trial period to 60 days.
- ◆ **Full parts and labor warranties:** 1 year on systems; 5 years on *OmniKey*® keyboards.
- ◆ **Overnight shipment of replacement parts—** at our expense.
- ◆ Northgate's unique 24-hour toll-free technical support leads the industry—most needs are met with just one call!
- ◆ **Free on-site service** to most locations if we can't solve your technical needs over the phone.
- ◆ **Northgate makes state-of-the-art power affordable!** Charge your purchase to your Big 'N' card, VISA or MasterCard. Ask about financing and leasing options, too!
- ◆ Call Northgate before you decide to buy elsewhere. You'll be amazed at our new low pricing!

"What WordPerfect® is to software support, Northgate is to hardware, and there are even a few things WordPerfect could learn from the folks in Minneapolis."

Bernie Zilbergeld
Bay Area Computer Currents
August 14, 1990

Select desktop or optional vertical power case.

Northgate's elegant desktop case features 5-bays with room for 3 exposed and 2 internal half-height devices. Comes with 200 watt power supply. For greater expansion capabilities, choose our vertical 7-bay powerhouse with a 220 watt power supply.

Northgate Page Mode 386/20 MHz

As a cost-efficient, dependable network file server, Page Mode has no equal. Its reliability is confirmed by Novell® certification and by users of office networks every day. Northgate boosts performance of this 386/20 workhorse through the use of an efficient page mode memory management scheme. Other performance features include:

- ◆ Intel® 80386/20 MHz processor
- ◆ 4Mb of RAM (expandable to 16Mb)
- ◆ 40Mb hard drive
- ◆ 1.44Mb and 1.2Mb floppy drives
- ◆ 16-bit VGA video adapter
- ◆ Eight expansion card slots
- ◆ One parallel and two serial ports
- ◆ MS-DOS 4.01 and GW-BASIC installed
- ◆ Microsoft® Windows™ 3.0 and mouse
- ◆ 14" VGA gray scale monitor
- ◆ OmniKey keyboard
- ◆ FCC Class B Certified

\$2499⁰⁰ Or as low as \$85⁰⁰ per month*

Northgate Elegance 386/486 Common Features:

- ◆ American-made motherboard
- ◆ RAM expansion up to 8Mb on motherboard (16Mb total RAM with 32-bit memory card)
- ◆ 16-bit VGA video adapter
- ◆ One parallel and two serial ports
- ◆ MS-DOS 4.01 and GW-BASIC installed
- ◆ Microsoft® Windows™ 3.0 and mouse
- ◆ FCC Class B Certified

Northgate Elegance 386/25 & 33 MHz

The best in their respective classes! Both are ideally suited for managing large databases (over 1000 records), full-time business accounting, multitasking and other demanding applications.

Northgate gives you a powerful standard configuration including high-speed 64K RAM cache and 4Mb of RAM. Take a look at everything you get:

- ◆ Intel® 80386/25 or 33 MHz processor
- ◆ 4Mb of RAM
- ◆ 40Mb hard drive
- ◆ 64K SRAM read/write-back cache
- ◆ 3.5" 1.44Mb and 5.25" 1.2Mb floppy drives
- ◆ 16-bit VGA adapter
- ◆ 14" VGA gray scale monitor
- ◆ OmniKey keyboard
- ◆ Novell Certified

25 MHz **\$2999⁰⁰**
Or as low as \$105⁰⁰ per month*

33 MHz **\$3299⁰⁰**
Or as low as \$115⁰⁰ per month*



Northgate Elegance 486/25 and NEW 486/33 MHz ISA

In addition to receiving an Editors' Choice and 1990 Computer Shopper Best Buy Award, Elegance 486/25i outscored all competitors in InfoWorld Magazine's 1990 reviews of 486 systems. Elegance "leads the pack by a comfortable margin", they said. "It offers impressive performance, exceptional expandability and it is tops in support and value."†

NOW! Northgate introduces the next generation—Elegance 486/33 ISA. Both systems are ideal for heavy-duty business applications like full time database management, CAD/CAM, financial planning, accounting and programming. Includes:

- ◆ Intel 80486/25 or 33 MHz processor
- ◆ 4Mb of RAM
- ◆ 40Mb hard drive
- ◆ 64K SRAM read/write-back cache
- ◆ 3.5" 1.44Mb and 5.25" 1.2Mb floppy drives
- ◆ 16-bit VGA video adapter
- ◆ 14" VGA gray scale monitor
- ◆ OmniKey keyboard
- ◆ Novell Certified (486/25)

25 MHz **\$5199⁰⁰**
Or as low as \$180⁰⁰ per month*

33 MHz **\$5799⁰⁰**
Or as low as \$200⁰⁰ per month*

Standard Upgrades (Add to the base system price)

Hard Drives	14" NEC VGA Gray Scale 800 x 600	Gold Star 14" VGA Color 640 x 480	Panasonic 14" VGA Color 1024 x 768	NEC 3D 14" VGA Color 1024 x 768
40Mb IDE	\$ 0.00	\$300.00	\$ 400.00	\$ 650.00
80Mb IDE	\$200.00	\$500.00	\$ 600.00	\$ 850.00
100Mb IDE	\$300.00	\$600.00	\$ 700.00	\$ 950.00
200Mb IDE	\$600.00	\$900.00	\$1000.00	\$1250.00

Call for the latest pricing and custom configuration specifications.

CALL TOLL-FREE 24 HOURS EVERY DAY **800-548-1993**

New... fax your order toll free! 800-323-7182

Notice to the Hearing Impaired: Northgate has TDD capability. Dial 800-535-0602.



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FOCUS On RISC

FOCUS on HP
Universal Access to Data

FOCUS is a comprehensive toolset that will work with all popular data structures:

- Compatible with TurboIMAGE and HP SQL
- Shared structural design allows easy integration of relational, hierarchical, and network databases
- Extends SQL functionality with comprehensive 4GL capabilities

FOCUS LEVELS

FOCUS Version 5.5 From Information Builders Is Now Available For Your PA-RISC System

Is data analysis important to you? Do you need to represent your data in a variety of ways, including reports, graphs, statistical summaries or spreadsheets? FOCUS from Information Builders Inc. may be the answer to your prayers.

FOCUS is a fourth generation language and database management system (4GL/DBMS) that runs on mainframes, midrange systems and microcomputers. The production release of FOCUS 5.5 for the HP 3000 Model 900 MPE XL systems is now available, completing the suite of FOCUS applications for HP Precision Architecture (PA-RISC) systems.

FOCUS provides one common fourth-generation language to facilitate rapid application development, portability and universal data access in multiplatform environments. It also supplies access to PC/FOCUS, making it a complete database solution for distributed client-server configurations.

"FOCUS allows users to

select the database engine that best suits their needs, whether it is the FOCUS DBMS, HP TurboIMAGE, HP ALLBASE/SQL, or a third-party product," said Michael N. Consoli, Information Builder's division director of FOCUS for HP.

FOCUS for HP has been designed to take advantage of all the advanced file management facilities PA-RISC has to offer. On your HP 3000 MPE XL system, FOCUS runs in native mode, resulting in faster performance and optimal use of the PA-RISC architecture.

For data management and transaction processing, FOCUS allows you to model relationships using relational tables or more complex structures, such as networks or hierarchies. Data retrieval is optimized, and indexing can occur on any field. FOCUS helps to ensure database integrity and enforces all constraints, including referential integrity.

FOCUS also enables you to build transaction-oriented applications, including data entry, validation, table look-ups, computations, and transaction logging. Modify-Talk lets new FOCUS users rapidly prototype transaction processing systems.

The FOCUS screen manager provides design control, including screen description, field position and cursor movement. FOCUS for HP supports highlighting, inverse video, blinking fields, and line characters, which allow you to customize your application.

If your business relies heavily on graphics, FOCUS offers a range of business graphics, including pie charts, bar charts, histograms, scatter diagrams and connected point plots.

All FOCUS capabilities are immediately available for use with TurboIMAGE data. No data conversion is necessary. TurboIMAGE lets your developers create structures that meet very specific needs. For example, AutoIMAGE is a dynamic FOCUS facility that automatically defines TurboIMAGE master and detail sets, eliminating the need for manual translations.

Tracing capabilities are also provided with the FOCUS Interface to TurboIMAGE. Trace return codes let you display the SQL code generated from FOCUS statements, along with TurboIMAGE's responses. You can track and display these responses on screen, or send them to an external file.

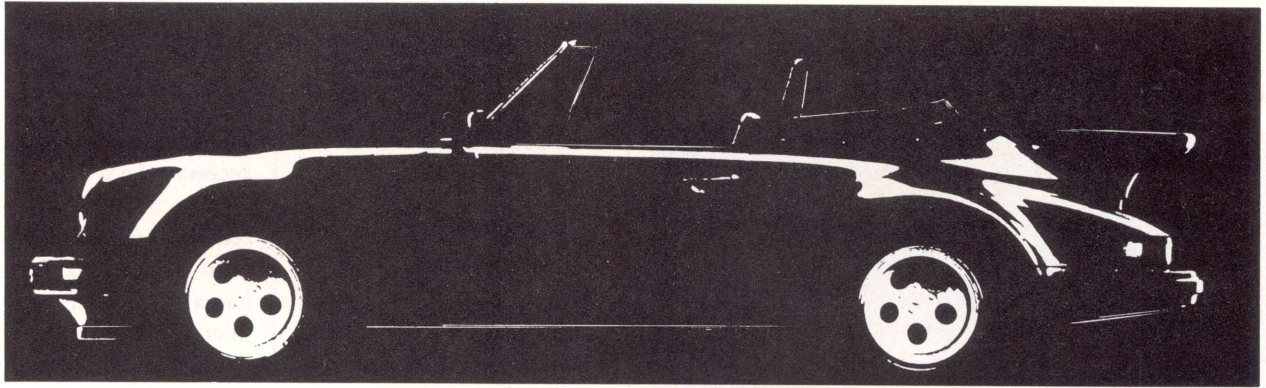
The FOCUS for HP MPE XL Interface to TurboIMAGE requires the FOCUS Report Writer and is supported on all HP 3000 Series 900 MPE XL systems.

One-time license fees for full FOCUS release 5.5 on HP 3000 Model 900 systems range from \$25,000 to \$160,000 depending on CPU size. Monthly lease options are also available. —George T. Frueh, Technical Editor

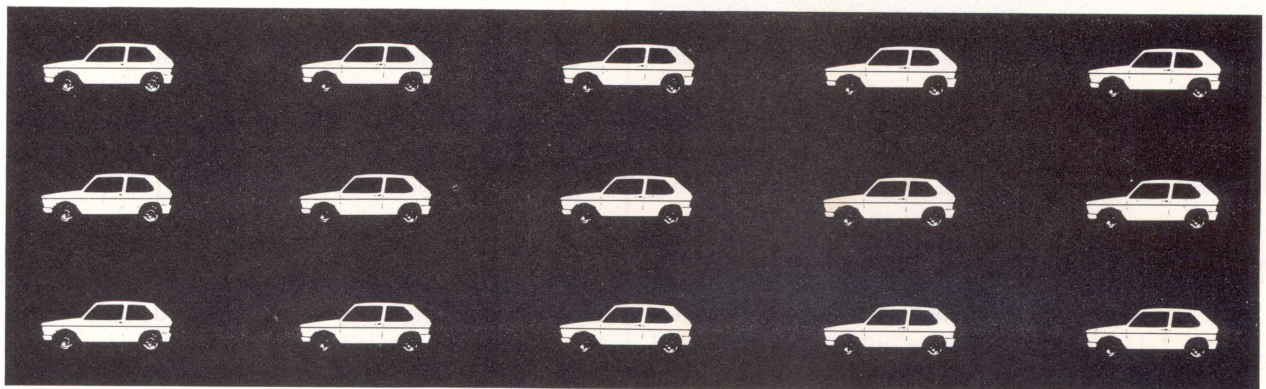
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If you think it costs a fortune to have software tailored to your company's exact sales and purchase order requirements, think again. Cardinal's unique approach to order management gives you the fit and functionality of a custom solution for about the price of a canned package. The secret: the Cardinal Configurator, an exclusive architect-

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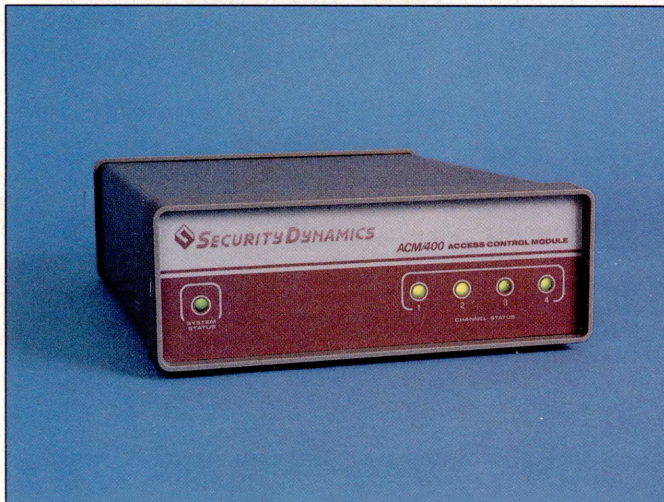
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Hackers Beware



Computer Hackers Don't Stand A Chance with Security Dynamics' ACE System

Computer hackers are folks who have sophisticated means of (electronically) hammering away at a computer system until they get in. Once in, these unauthorized users can steal, corrupt and even destroy information that's vital to a company's existence.

Today, computer hackers and computer crimes are rising and cost businesses and industries billions of dollars per year worldwide. One company helping to fight unauthorized access to computer systems is Security Dynamics Inc. (SDI; Cambridge, MA).

SDI's Access Control and Encryption (ACE) technology presents a few more obstacles for the computer hacker and a greater security level than traditional systems.

The ACE computer security system consists of two components: the Access Control Module (ACM) — a software package or hardware device, and the SecurID Card — a credit card-sized token that's carried by authorized

users requiring access to the computer system.

The ACM/400

Security Dynamics offers several versions of the ACM hardware device, depending on your platform and load requirements.

The most recent addition to the ACM family is the ACM/400. It's a tamperproof, rack-mount unit designed to secure small to mid-sized computer systems and networks against unauthorized users.

It measures 8 inches wide, 10 inches long and 3 inches high and provides positive identification for up to 200 users. The ACM/400 connects directly with any RS-232 asynchronous host and protects up to four incoming lines (terminals, modems, leased lines and networks).

"The trend toward easier and expanded system and network access from inside and outside the organization, especially in decentralized, departmental and small computing centers, is making computer security, beyond the traditional static password, essential," says Charles Stuckey, SDI's president and CEO.

The SecurID Card

With the ACE computer security system in place, you gain access to a system by entering a Personal Identification Number (PIN). This is like entering your password. Then you enter the code currently displayed on your SecurID Card. If both num-

bers are correct, you can gain access to the system.

The SecurID card has a readable LCD located on the front of the card. Each card has an internally powered microprocessor that generates a new, unpredictable access code every 60 seconds and no two cards are alike. This pseudo-random digital code is permanently synchronized with the system's ACM through internal clocks in both the SecurID Card and the ACM.

The SecurID Card is designed to stop working at the end of its programmed lifetime (typically one to three years) and then must be replaced with a new card. The internal batteries cannot be replaced. Any attempt to open the card and replace the battery permanently disables the card.

The ACM/400 is base priced at \$3,800 per unit, with quantity discounts available. Prices for SecurID Cards start at \$34 each. Options are available at a higher cost.

With the ACM/400 and the SecurID Card combination, hackers will have one tough time breaking and entering your computer system. *George T. Frueh, Technical Editor*

Security Dynamics Inc.
One Alewife Center
Cambridge, MA 02140-2312
(617) 547-7820

CIRCLE 337 ON READER CARD

We Have The Key To Critical Item Updates

Critical item updates have long been a problem for the IMAGE database user. When a key value needs to be modified, the record has to be deleted and then added back to the database. That's not much fun, especially when there may be hundreds of keys that need altering. Critical item updates shouldn't be this difficult. And they aren't!

With DB-KEY-CHANGE, critical item updates are a 'snap'. DB-KEY-CHANGE allows you to modify the value of an item (critical or not) in all occurrences throughout a database. And for those of you that have been waiting for a solution, there's one available today. In fact, DB-KEY-CHANGE has been around for over six years and HP 3000 users everywhere have been modifying critical item values in their manufacturing, accounting, distribution and other application databases using DB-KEY-CHANGE. Why? Because DB-KEY-CHANGE allows you to modify key values quickly and easily. It even allows you to modify values on-line or in batch and gives you the option to exclude those sets that you don't want the changes to affect.

DB-KEY-CHANGE capabilities include the following:

Whether the key is used as a search, sort or regular item, all values can be modified in all their occurrences throughout a database

Alphanumeric item values can be altered on a partial key basis

Individual datasets can be excluded from modifications

Compatible with IMAGE, TurboIMAGE, and TurboIMAGE/XL

Value modifications can be processed in batch or via a flat file, and an ON-LINE job generator is also included

Modifications processed in batch can be monitored using the built-in TELESCOPE interface

If you're tired of changing key item values the hard way, get DB-KEY-CHANGE from Bradmark. We take the burden out of critical item updates, providing you with the power to modify these items quickly and easily. Call a Bradmark representative today for a **FREE** trial copy of DB-KEY-CHANGE and see for yourself. In the U.S., call **1-800-ASK-BRAD**.



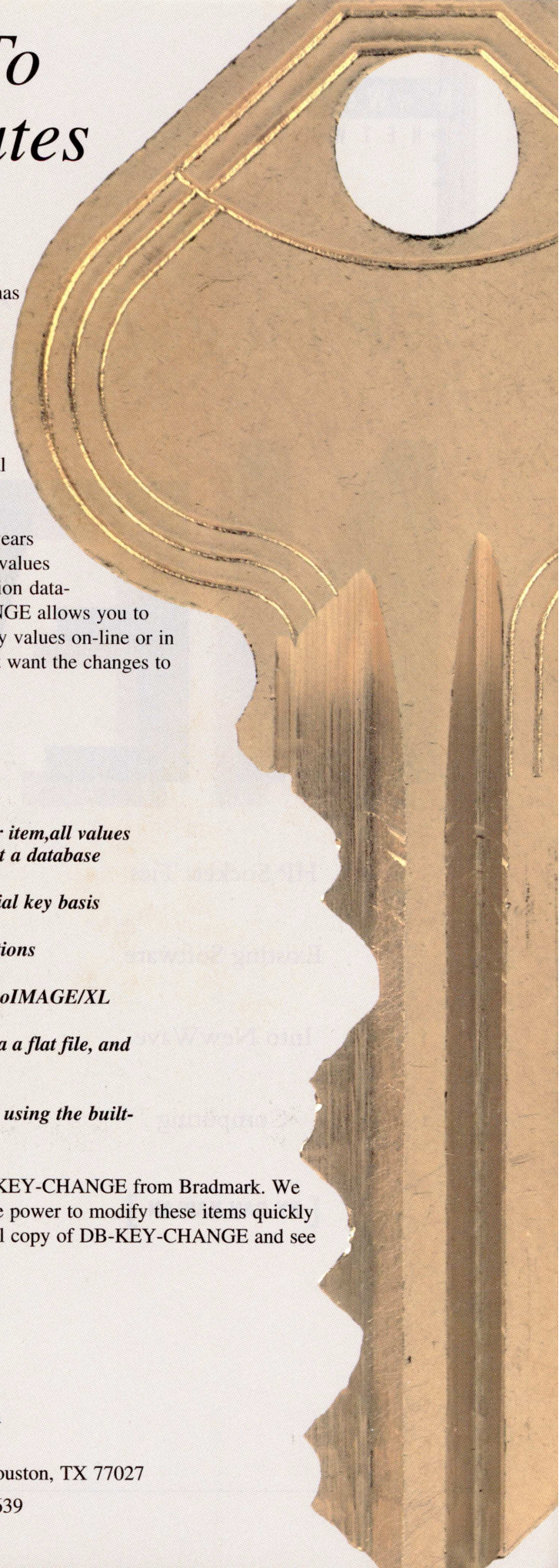
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CIRCLE 109 ON READER CARD



Plug In To

NEW WAVE

HP Sockets Ties

Existing Software

Into NewWave

Computing

[BY DAN KAPLAN]

You've probably heard a lot about HP's vision of cooperative computing—NewWave Computing. The NewWave Computing strategy promises to make you more productive, as an individual and as a member of a team, through application integration, task automation and a unified user interface. The word “cooperative” means working together. According to HP's vision, all of the computers in your operation should actually be working together, allowing you and your company to concentrate on doing your job rather than gathering information.

Given the difficulties involved in application integration, you can sometimes feel that your real job is getting data out of one computer and putting it back into another one. This manual integration of data is not only error-prone, it also wastes your computing resources. When standard technologies are pervasive, allowing interoperability of all of the computer products that you use, you can deploy your data processing capabilities much more efficiently.

NewWave Computing has some strong selling points, but the question on everyone's lips is: How do you do it? Technologies such as object-oriented programming and agents, which are at the core of HP's vision, are designed to make possible a seamless integration of software applications — as long as they're developed with compatible object management facilities. That's



AVE

an exciting technology advancement, but it leads to another popular question: How do you integrate existing software with NewWave Computing applications? HP claims to have answered that crucial question with the July 1990 release of its Software Integration Sockets product — HP Sockets. Let's take a look at HP Sockets and explore the possibilities it affords for integrated NewWave Computing in your environment.

To understand HP Sockets, and how it allows you to tie non-cooperating software applications on diverse platforms into integrated systems, you first need to know a little about what software application integration is, and what makes it difficult. Let's look at an example of where you would want to integrate software applications running on different platforms.

Application Integration

SUPPOSE THAT YOUR COMPANY uses a Materials Requirements Planning (MRP) system running on an HP 3000. Among other functions, this MRP system calculates and maintains the schedule of shop work orders that your production facility needs so they know what to work on next. You have automated your production facilities from the bottom up with automated work cells, equipment driven by what are called

“workcell control” computers, or cell controllers. Let us suppose also that you're using HP 9000 Series 300 computers, running HP-UX, for factory automation.

In order to help your work-center managers improve the responsiveness of their operations, you want to integrate your production equipment with your material planning system through the use of production scheduling software. This application also will reside on an HP-UX computer, in this case an HP 9000 Series 800. You can see these three systems and their respective software applications illustrated in *Figure 1*.

For the production scheduler program to work effectively, it needs to access the demand schedule from your MRP system, so that it can know which work orders need to be scheduled. Because you don't want to schedule orders at a workcell that's down for maintenance, the scheduler also needs a status check from the workcell controllers.

Once the schedule is calculated, it needs to be transported to the workcell controllers so they know what to do. Any exceptions — orders that can't be produced on time — need to be fed back to the MRP system. Finally, as the workcell completes orders, this information needs to flow back to the MRP system so that it doesn't include those orders in the next demand schedule. These data flows are described in *Figure 1*.

Now that you have an example of a case where software

application integration can work, you can see that this problem like so many business problems boils down to “getting the right data, in the right format, to the right place, at the right time, reliably and automatically.” The next question is: What makes this so difficult to achieve?

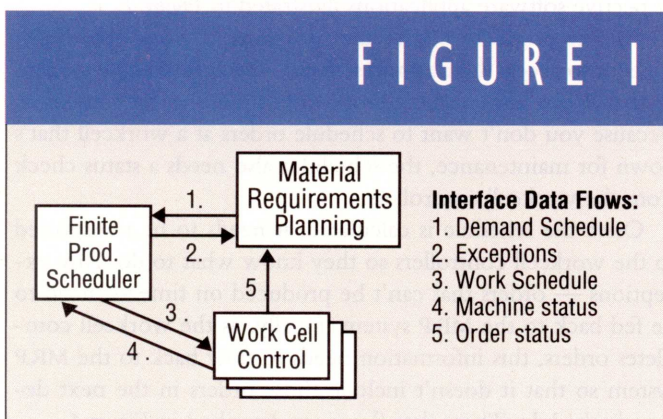
Integration Problems

WHETHER THE APPLICATIONS IN the example were created by your company or bought from a third party, whether they were custom-written for the job or packaged programs that happened to fit the bill, they almost certainly were written by different people. What’s more, it’s highly unlikely that these people cooperated in any way in the development of your applications. So, in addition to the different computing platforms, your applications probably differ in terms of the programming languages and development tools used to create them and the database management systems and data models they employ.

These incompatibilities cause problems in accessing data from one application or another, in transporting this data reliably from one application to the next, and in making this data mutually intelligible to different applications.

Such data access problems are difficult to solve without specialized expertise in the specific applications being integrated. It usually takes someone knowledgeable about an application to know how to get data in and out of that application. If the job is to exchange data between two applications, you need to have one person trained on both or hire two people to do the job. Either way is expensive.

Data also is usually kept in a database management system (DBMS) or in other data files. Most MPE applications use IMAGE databases, but on HP-UX platforms, some flavor of SQL is more standard. These databases differ in data types allowed and in how those types are represented. The MPE and HP-UX file systems differ in just about every respect possible: naming conventions, directory structures, permissions and types.



Example Integrated Systems.

If the job is to exchange
data between two applications,
you need to have one person
trained on both or hire two
people to do the job. Either way
is expensive.

The most significant problems in transporting data from one application to the next are the heterogeneous nature of the machines or operating systems comprising the network, the need for flexibility in configuration, and the low-level nature of most the networking software available. Your application programmers could end up spending their time solving networking problems rather than getting data from place to place.

Integration Means Communication

FOR OUR EXAMPLE, WE NEED to find a mechanism that allows communication — data transportation — between MPE and HP-UX systems. Today, HP’s Network Services provide NetIPC for Inter-Process Communications. Although compatible at the datagram level, some NetIPC procedure calls operate differently between the two systems. For example, the **ipcselect** procedure doesn’t even exist on MPE systems.

Reliable and instantaneous communications require code to be written on top of the IPC level to establish and maintain connections and to acknowledge receipt of data. This code would need to be implemented twice, once for MPE, once for HP-UX. Also, even if you’ve figured out how to get the right data out of the first application, automatically and reliably transport it to the second application on time, and get it into the second application, you still need to match the data formats used by each application. It’s unlikely that the applications will agree on things like:

- Field names.
- Field data type definitions.
- Possible or legal field values.
- Layouts of fields into records.

Moreover, even if by some chance they do agree on all of



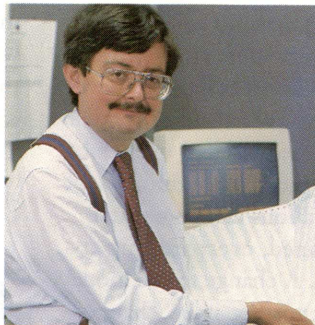
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these items, there always will be semantic differences. A "C" that is a legal value for the field called ORDER-STATUS in both the MRP and the cell control system could still mean "completed" to one application and "cancelled" to the other.

Different programming languages use different representation schemes for things like multidimensional arrays, Booleans and record structures. The C language, widely used in the HP-UX world, represents multidimensional arrays in row-major order, but FORTRAN implementations always use column-major order. Even the same language can vary across different computing platforms in how it represents data. For example, FORTRAN on the HP 9000 Series 300 represents the Boolean "FALSE" as zero and "TRUE" as any non-zero value. But FORTRAN on the HP 9000 Series 800 uses any even value for "FALSE" and any odd value for "TRUE". These data differences between applications need to be reconciled in interface code before meaningful information can be exchanged.

Alternative Integration Approaches

MANY COMPANIES ATTEMPT to avoid these problems altogether by implementing monolithic application systems that try to provide all the functionality needed to run a business in a single software application. These monolithic systems historically have been implemented on one large mainframe computer, but recent technology has evolved that allows the creation of monolithic applications that run in distributed environments. There are, however, serious shortcomings to both approaches.

If every software application across an entire business must be written to a standard data model, then that model must be developed cooperatively by all of the departments affected. This requires an interdepartmental task force to define an enterprise-wide data model. How many of these task forces have you ever seen succeed? How long would it take to create such a model? And, while the model is defined, maligned, argued over, lobbied against, and generally consumes inordinate amounts of everybody's time and energy, no applications can be written.

Even if the model is successfully defined, every existing application must be rewritten to support it. A change to the model would require that all applications supporting it be changed. Adding functionality would be difficult, and the choice of third-party software would be limited to applications that can be customized to support the model. Even this customization would be expensive.

Also, would you really want to restrict the platform choices of your software developers or your application user community? Is there any one platform that's suitable for *all* of your business's computing needs, from production control all the way up to the corporate business systems? These days, there are many UNIX people who claim their favorite operating system can handle the variety of tasks, but what about the legacy of exist-

ing applications you have? Could you afford to throw them out and start all over?

These shortcomings are likely to lead you to try a different approach: creating custom coded interfaces between existing applications. These interfaces usually consist of software to access data, transport it from application to application, and match the data formats of the communicating applications. This method allows for incremental growth and doesn't force major changes on the applications being integrated. However, it has some major drawbacks.

Interface code is often difficult to write, and if the interface is between applications residing on heterogeneous computers, the difficulty is multiplied. The interface developers must be concerned with application specifics like import and export syntax; they must know about the networking services or protocols used to provide high-speed and reliable communications. In our example, the interface developers would need to be familiar with both MPE and HP-UX versions of network services and how they interact. Development, debugging, and maintenance require expertise on both platforms. Additionally, a lot of code would need to be written to map the differing data formats before data compatibility could be achieved.

This code would then become a support burden to the application, since it would need constant maintenance and would be sensitive to changes or upgrades to the applications, the networking layers and the operating systems. And, if the code were implemented on both operating systems, MPE XL and HP-UX, operating system updates would arrive twice as fast. Worse, updates to one operating system might affect code written on the other, especially because this code would communicate between the two.

Horror stories abound of companies who spent several million dollars attempting to integrate factory automation software before giving up. It's probably not an exaggeration to say that the promises of CIM were broken by an inability to make custom-coded application interfaces supportable.

HP Sockets

EXPERIENCE WITH BOTH OF these approaches is what led HP to create the Software Integration Sockets product. The idea behind the product was to create a cost-effective and supportable way to solve application integration problems.

Specifically, HP Sockets is a tool for developing supportable interfaces between non-cooperating software applications on HP-UX and MPE XL platforms. It takes data from one application, in the application's own format, and delivers the data to the next application in that application's format. This allows you to build integrated systems out of both third-party and home-grown application packages. In most cases, the applications require no modification to use HP Sockets.

HP Sockets consists of a small set of access routines (12 to be exact) out of which application interfaces can be created, a set of tables that describe the environment to be integrated and an administrator to control this environment.

The Access Routines

THE 12 ACCESS ROUTINES provide application-level connectivity functions, such as sending and reading messages, sending a file, starting or stopping another program, and identifying oneself to HP Sockets. For example, in order to send a message to another process, the send message routine is used. The sending process doesn't have to:

- Know where the receiving program resides.
- Open the communication subsystem to the remote host.
- Maintain reliable communications over the network.
- Invoke receiving communication program on the remote host.
- Handshake with that program.

All of these steps have been provided by HP Sockets. The same access routines are used whether the target of communications is local or remote. Therefore, the interface can be developed without regard to the actual network topology that

will be used at runtime, and the interface developer never needs to access the specific networking service-level routines to provide this communication.

The Configuration Tables

IN THE ACCESS ROUTINES, identifiers are used rather than any specific information like network node addresses, program names, locations, invocation parameters or file system locations. These identifiers are then defined in six configuration tables, which contain information about:

- Network node addresses.
- Where application programs actually reside on the network.
- File attributes to use in file transfer.
- Link definitions that map sending and receiving programs.
- Data definitions of messages being transferred.
- Data manipulations to apply to messages being transferred.

These tables contain all of the information needed to fully describe the environment of the integrated system, and all of this information can be changed without affecting the interface code developed with the HP Sockets Access Routines. This information resides on a node designated as the "HP Sockets Ad-

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ministration Node." On this node, the administration program is accessed to control the functions of this integrated environment.

The System Administrator

THE SYSTEM ADMINISTRATOR IS secured through password from unauthorized access, and provides the following functions:

- Startup/shutdown of the communication subsystem.
- Administration of HP Sockets passwords.
- Setup of HP Sockets runtime parameters.
- Validation and activation of configuration information.
- Transfer of administration to an alternate node.

These functions are simple and can be performed by system operators. Shutdown is graceful, with undelivered messages being stored so that they may be delivered at the next startup. You can start up or shut down the entire integrated environment from one command issued at the system administrator node. You don't need to run from console to console to control the communications systems.

In addition, you need only designate certain nodes as alternate administration nodes, and HP Sockets automatically distributes all necessary information to those nodes so that they may become surrogate administration nodes in case of a LAN breakdown or a system crash at the currently designated administration node. This provides you with a single point of control without creating a single point of failure problem for the integrated system.

Using HP Sockets

LET'S LOOK AT HOW HP Sockets might be used to integrate our MRP example. We've already analyzed the system and determined its main components, functional requirements and data flows. (This would obviously be the first step to follow no matter how we intended to integrate the applications.) To complete the task we would need to:

- Design and build the interface programs.
- Build the configuration files.
- Test and run the system.

The interface programs, also known as "adaptors," are built from the HP Sockets access routines that provide application-to-application communications. Using these 12 routines should save you from creating the thousands of lines of code that would otherwise be needed to ensure reliable communications. At this step, then, HP Sockets offers at least the potential for a tremendous savings in programmer productivity.

The configuration files are simply ASCII files built in any text editor. Through using these files to specify site-specific and application-specific information, tremendous flexibility can be

added to the integrated system because so many things can be changed without altering the interface source code. System variables you can specify at this level include:

- Network addresses of communicating processes.
- CPU where the processes reside.
- Actual program names of communicating processes.
- Account structure where processes reside.
- Communication buffer sizes.
- Invocation or execution parameters for process control.
- Required data format at other end.
- Local data format.

Just having all of the information that's in the configuration files in one place can be a major benefit. Most integrated systems have to be implemented piece-meal from the ground up, and figuring out what communicates with what requires extensive research. With HP Sockets, however, the entire integrated system is accurately described in the configuration tables.

Finally, HP Sockets provides several tools to help test and run an integrated system. There's a command processor that allows you to use the access routines interactively. This allows you to simulate interface routines before actually coding them, either to determine whether the algorithms are correct or to simulate the other end of a communication, which is perhaps being developed elsewhere. Also, there is error and data logging to help audit the activity of the system. This is especially useful as a diagnostic tool to determine where data is being altered. HP Sockets' error messages are specifically designed to help you keep an integrated system running smoothly.

Hewlett-Packard released HP Sockets on August 1, 1990 for the HP-UX computers. It will be available in March 1991 for MPE XL. Its access routines can be called from programs written in C, PASCAL and FORTRAN, with COBOL coming in March 1991. Currently, other platforms are being investigated, including some popular non-HP computers. HP also has been working with many of its premier solution providers to support HP Sockets in their products especially in the areas of factory automation, state and local government, and retail.

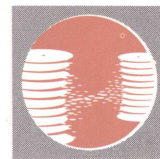
The adaptive nature of HP Sockets makes it one means for integrating applications developed under diverse technologies. You can use it for integrating object-oriented and non-object oriented applications, and HP is investigating whether it can be used to provide integration at the object manager level. This would enable you to integrate applications developed under different object managers.

HP Sockets is HP's proposed method for integrating applications that were not developed to be cooperative. It provides a bridge from today's discontinuous multiplatform environments into the seamless world of NewWave Computing.—*Dan Kaplan is the product manager at HP's Industrial Applications Center in Sunnyvale, CA.*

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O P E N *Observations*

HP's Glenn Osaka Shares
OSF/1 Development And Marketing Strategies



T

he following are excerpts from an interview that *HP Professional's* UNIX Editor, Andy Feibus, conducted with Glenn Osaka, Hewlett-Packard's principal liaison with the Open Software Foundation (OSF). Since March 1989, Osaka has been HP's

Manager of Open Systems Software Planning and is responsible for coordinating HP's development and marketing activities related to the OSF. Osaka has been with HP for 11 years.

Feibus: What is "OSF/1?"

Osaka: OSF/1 is really three things that have, from time to time, carried the name OSF/1:

- The OSF/1 operating system kernel. OSF also has called this the OSC/1 for "operating system component," the technology released by OSF in November 1990. It's a combination of the best technologies that OSF could acquire from a variety of sources, including the Mach kernel (from Carnegie-Mellon University with parallelization features and enhancements from Encore Computer), commands and libraries from IBM's AIX, IBM's logical volume manager (which

permits files to span different disks and provides disk mirroring), National Computer Security Center (NCSC) B1 security from Secureware and more. This kernel technology is what is most often referred to by the press as OSF/1.

- The OSF/1 operating *environment* is the combination of technologies that includes the OSC/1, OSF/Motif (the graphical user interface), OSF/DCE (the Distributed Computing Environment), and will include, in the future, the results of additional Requests For Technology (RFTs). In the near-term, this will include the Distributed Management Environment (DME) and the Application Neutral Distribution Format (ANDF).

This, I believe, is the most useful definition of OSF/1, because it's at this level — as an integrated environment — that customers will deal with the technologies.

- The OSF/1 Application Environment Specification (AES) documents the stable set of programming interfaces for the development of applications that easily port from one conforming system to another. The specification has so far been published for OSF/Motif and for the OSC/1.

[BY ANDY FEIBUS]

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YES	Engineering Math: Matrix Math, Complex Numbers	YES
YES	High Level Graphics: Screen, Plotter, Printer	YES
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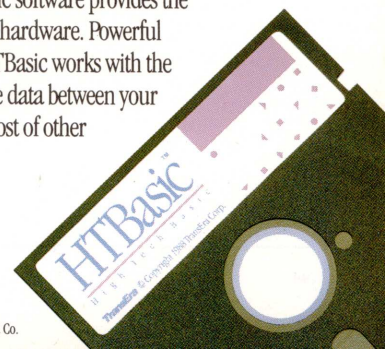
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“The core kernel
allows you to specialize
the operating system
for a particular
purpose.”

Glenn Osaka
Hewlett-Packard

Feibus: There were new announcements made in October of last year concerning OSF/1. Could you tell us a little about those?

Osaka: Yes, that was like the second edition of the original founding sponsor's press conference that we did a couple of years ago. And, what we assembled was, of course, all of the marketing people and a lot of the executives that were originally involved in the sponsorship and formation of OSF to announce the shipment of OSF/1.

Feibus: Just the shipment of the kernel technology was announced at that time?

Osaka: Yes, the November shipment was the OSC. The announcement also served as an opportunity for all the sponsors to make product announcements and statements of direction.

HP essentially reiterated the statements it's made in the past: Product-type, kernel technology will be available in 1991 on RISC-based workstations first, and we intend to move the company overall to the technology in a phased approach. I would expect that IBM and DEC will be making [similar] announcements.

Feibus: How does OSF/1 compare to AT&T UNIX System V Release 4.0?

Osaka: I assume that in comparing OSF/1 to System V.4, you would like to do so at the “environment” level. In this comparison, you should note the high degree of base compatibility between the two environments. Both will support POSIX, ANSI C, the X/Open Portability Guide Issue 3, and X Windows. Both have objectives to provide a smooth migration path for existing applications running on UNIX System V Release 3, Berkeley Software Distribution (BSD) Release 4.3, and Santa Cruz Operation's Xenix. Customers should find minimal differences between the two [UNIX V.4 and OSF/1] in moving existing applications running on these [other] platforms (see Table 1).

Micro-Kernel Technology

Feibus: I understand that OSF/1 makes use of micro-kernel technology. In high-level terms, what is that?

Osaka: Let's use the analogy of RISC computing. What was done in RISC hardware architecture vs. CISC architecture basically was to do an analysis of everything that's done by a computer system, take those essential components that must be performed quickly or with the highest performance, put them into hardware and do everything else in software. That's the basic premise behind RISC. The micro-kernel design has the same kind of premise.

Let's talk about UNIX generically rather than specifically. Generically, what's happened to UNIX, in what we're calling its “middle age,” is that it's gotten much uglier. It started out small, compact and portable. But as companies and developers added more and more functionality to it, it got to look more and more like an old, complex operating system.

So, we've taken the same approach as the RISC designers and said let's isolate UNIX down into its barest kernel of functionality, call that the micro-kernel or core kernel and use it as the basis for future operating system development. What this approach implies is that all the other functionality you might want to have executed in the operating system is done outside and what you will do at the same time as you go through this production process is modularize all the other components of functionality.

The core kernel allows you to do a bunch of interesting and exciting things. One is that you can put multiple operating system personalities on top of the micro-kernel. So, for example, the micro-kernel could facilitate having a DOS or OS/2 environment on top of a common operating system kernel, an MPE environment in HP's case, or the POSIX-UNIX-X/Open environment. You could have this multiple personality perspective based on a single core kernel technology.

You could also specialize the operating system for a particular purpose. Right now, to develop a file server, a database server or a print server, you either have to write a proprietary piece of software — essentially an operating system — to run this thing or else you have to use one of the generally available operating systems like UNIX or DOS to run the environment.

But these operating systems carry a lot of baggage that isn't useful. With a micro-kernel approach, you could take the micro-kernel and only that layer of technology above it that's required for a print server, for example, and have a much more efficient, much better performing, and much more maintainable operating system environment for that task.

From another perspective, a micro-kernel offers benefits like modularity of code, which would enhance HP's in house software productivity, and the ability to buy modules from organizations outside of HP so that we don't have to build everything ourselves. From a customer perspective, you could expect to see much more efficient, high performing, specialized servers and general computer systems, as well.

Feibus: Is this modularity basically the same reason why a Mach-based kernel is going to be better for customers and why OSF made the decision made to go with Mach?

Osaka: It's a long-term decision, not a decision that's based on short-term functionality. If you look at the comparison with System V.4, there are a few incremental benefits to the OSF environment, but not so many that the general, purchasing public is really going to care today. The two are roughly equivalent.

The real advantages to Mach are in the long-term benefits. The state of the generic UNIX environment is affecting everybody. Sooner or later those people that are choosing to use AT&T System V.4 are going to have to make a shift into a more modular environment.

I think, from an OSF perspective, that modular architecture is going to get you now or get you later. It's a matter of when companies reach the point in their own development activi-

ties, or when the marketplace as a whole reaches the point, where it's absolutely essential to have modular architecture.

I think if there were two reasons why HP is much more interested in the Mach technology and the OSF technology than anything else, they would be modular architecture — the environment that provides for the long-term — and the opportunity to participate in the request for technology process. Those two pieces are what really got us to buy in.

The Path To OSF/1

Feibus: Could you compare OSF/1 to HP-UX from a features/environment perspective.

Osaka: As base operating system technologies, OSF/1 and HP-

[The comparison between the two systems are shown in the following table. A + before an item indicates a favorable feature; a - denotes a weakness.]	
OSF/1	UNIX System V Release 4.0
+ Mach-based kernel for modularity. Hardware-dependent aspects of the OS isolated to provide optimum portability.	- Not Mach-based; Unix Software Laboratories (USL) is working to evolve a more modular architecture (i.e., streams, etc.).
+ Standards compliance and portability for existing BSD, System V and Xenix applications.	+ Same.
- Shipped in November 1990 from OSF to licensees.	+ Source available at the beginning of 1990.
+ Support for symmetrical multiprocessing.	- Planned for later release.
+ NCSC B1 security level with "pathway" to level B3 with micro-kernel.	+ B1 level security features as a separate product on Release 3. Future release planned with B2 features.
+ Logical volume manager	- Similar features planned for future release.
+ OSF/Motif graphical user interface, shares the look and feel of Microsoft Windows/Presentation Manager.	- Open Look graphical user interface receiving less support amongst software developers.
+ Expanded capabilities/services for interoperability provided by OSF/DCE.	+ Installed base of Network File System (NFS).
+ Distributed management RFT in process for systems/network management of heterogeneous environments.	+ Remote system administration facilities planned for future release to manage distributed UNIX systems.

Table 1.

UX are architecturally different (Mach-based vs. System V-based). But from a features/environment perspective, they are very close. This is what makes it possible for HP to move its large customer base over to OSF/1 systems with relative ease. In fact, we're facilitating this by making HP-UX comply with the programming interfaces for OSF/1, which enables us to ensure portability for our current customers.

The places where the systems differ are related to the "added value" that HP has provided in HP-UX. For example, we've added high-availability features to HP-UX for commercial business users of the HP 9000, and we've added powerful graphics capabilities for our workstation users to support CAD applications. We're carefully evaluating each of these enhancements to determine whether we should wait for OSF to provide the functionality, or if we need to add this capability to OSF/1 ourselves. We'll add it if it's clear that OSF won't provide it, or if it's viewed as essential for customer migration.

Feibus: Why do customers want to migrate to OSF/1?

Osaka: Customers want to migrate to OSF/1 for several reasons:

First, superior features. We believe this will become increasingly apparent to users as the OSF environment matures. OSF, as a development organization, leverages the work of all its members and uses the RFT process to make strategic technology selections. Over time, the best new technologies will be available most quickly on OSF-based systems.

Second, application migration will be easy. We'll be timing our OSF/1 program so that groups of targeted users will find migration to the environment attractive with each new release of HP's OSF operating system. The first targeted group is our current base of Domain/OS developers and users. We expect to see current HP-UX customers migrate to OSF/1 as the functionality that these customers demand from their systems is added. We've chosen to structure our product program this way because of differences we see in our customer segments and the need to rationally balance and manage our R&D efforts.

Third, OSF/1 will become the "environment of choice." With major programs underway for the adoption of the OSF/1 environment at IBM, DEC, HP, Groupe Bull, Nixdorf Siemens, and Hitachi, we believe that customers and software vendors will come to view OSF/1 as a "de facto" standard.

Fourth, a reasoned approach to the evolution of open systems. The OSF/1 environment explicitly takes into account the realistic approach that computer users must take in adopting open systems. In particular, the RFT process is based upon the real heterogeneous computing requirements that are prevalent today.

OSF is not attempting to create a world completely based on UNIX (or the OSC, for that matter). There will be substantial installed bases of proprietary systems for many years to come. Customers need technologies that solve the problem of heterogeneous interoperability, not just interoperability between UNIX systems. OSF's modular approach to the RFT and the

adoption of technologies that bridge the gap to proprietary systems are indicative of this real-world perspective.

Feibus: What will HP add to OSF/1's utilities and features beyond what's included in the standard release?

Osaka: As I've mentioned, we intend to make the first release of OSF/1 specifically attractive to the Domain/OS user. With that in mind, we've added what Apollo customers have known as "layered products," which make the system more familiar to the Domain/OS user. We'll be offering Network Computing System-based technologies like Omniback, Password, etc., and Network License Server, in addition to compilers and development tools that the Domain system is famous for.

We're particularly excited about OSF's selection of a DCE built around HP Apollo's NCS and the Andrew File System (AFS). These technologies in the OSF environment allow users to enjoy the same benefits of distributed network computing that our Apollo users have enjoyed for years.

Push Or Pull?

Feibus: When is HP planning to phase-out Domain/OS and HP-UX?

Osaka: We don't have a firm date. There are two ways to look at this. There is the push strategy and the pull strategy. The push strategy says that Hewlett-Packard, for its own reasons, demands that all users move to OSF/1 as soon as possible. The pull strategy allows customers to make the decision based on when the environment meets their requirements. This lets the marketplace decide. We're taking the pull approach.

But there are several reasons why the pull is going to occur rapidly. One is that all these major computer vendors are moving to OSF/1. The only limiting factor is the availability of applications from software developers. So, I think what you'll see happen is that we'll replace Domain and HP-UX when two conditions exist: One, when the ISV applications are there and two, when the majority of our customer revenues are coming from it. Again, we haven't set a firm date.

As an example, we're continuing to offer all the operating system environments we offer today on the HP 9000 Series 400. There are no plans to stop the development or enhancement of HP-UX.

Feibus: In other words, HP-UX version 8.0 is still scheduled.

Osaka: Yes, 8.0 is still on track. We're also planning for 9.0, and, I would even expect there to be a 10.0. We're being a little less aggressive with Domain because, in our phased approach, we're targeting OSF/1 enhancements at the Domain user base first. And, that's consistent with what a lot of the Domain customers have been telling us: They would like to move to an industry standard operating system that can offer the functionality and the environment of Domain.

Feibus: Among the features important to HP-UX users are the

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system's real-time capabilities. When do you expect those to be found in the OSF operating system?

Osaka: We're waiting for the completion of the POSIX 1003.4 subcommittee work, which will standardize the interfaces to real-time functions in the operating system. They are not currently in the OSF/1 release, and I would expect that they won't be added during 1991. This is my personal supposition. Just because of where the committee is in its process and what it's going to take to do the engineering, I'd expect to see it sometime in 1992. That's a personal projection, not one from OSF.

Feibus: What are the current plans for other companies to implement OSF/1?

Osaka: We've seen public commitments from all the major sponsors of OSF to begin marketing OSF/1-based systems in 1991. IBM has indicated that they will be selling a PS/2 system with OSF/1. Digital has indicated that they will begin to integrate OSF/1 into ULTRIX.

Feibus: You mentioned that IBM plans to release OSF/1 on the PS/2. What are HP's plans for OSF/1 on the Vectra?

Osaka: HP is not prepared to make any product announcements at this time regarding the Vectra. I can, however, tell you this: The Santa Cruz Operation (SCO), which currently supplies its operating system to HP for the Vectra, is an active member of OSF (and of UI). We have worked closely with OSF, SCO, and other sponsors and members to highlight the importance of being able to run an SCO "shrink-wrapped" application on OSF/1-based Intel platforms in the future. We supplied the hardware to a project consortium consisting of SCO, Locus Computing and OSF to guarantee that the technology will be available to accomplish that.

The Shrink-Wrapped Factor

Feibus: On the subject of shrink-wrapped software, would you like to talk a little about the Application Neutral Distribution Format (ANDF), what that's going to do for people and why it's such a hot topic?

Osaka: There's been a lot of discussion in the industry about the need to have shrink-wrapped software available in order to enhance the viability of UNIX in the industry. This frequently comes up when people think about UNIX as a potential competitor to, or replacement for, OS/2 or as a growth path for DOS. We're talking about UNIX on the desktop, primarily.

The prerequisite for shrink-wrapped software in the past has been standardized development. I differentiate the term "standardized" from "standard," "standardized" meaning everybody's got to run Intel and everybody's got to run the same DOS bits. Then you can have shrink-wrapped software, because absolute binary compatibility is guaranteed. In the UNIX world, shrink-wrapped software exists today, but it exists only around Intel and SCO. It's making use of a specific set of bits and a specific hardware architecture.

Now, the power of shrink-wrapped software and UNIX in combination becomes exceedingly compelling, if what you can do is also gain the scalability that's available to you by going to other hardware architectures and perhaps other sets of operating system bits. Let's say you could buy a shrink-wrapped application that not only ran on Intel and SCO, but also ran on a SPARCstation or an PA-RISC product and with either SunOS or HP-UX or OSF. That kind of availability of application software through indirect distribution channels really could change the economics of the computer industry.

What OSF has done is to put out an RFT to evaluate contenders for technology that enables shrink-wrapped application availability across hardware architectures, and across operating system technologies. There's a range of technical solutions to this type of problem. They range, and these may sound absurd, from actually shipping source code to shipping tagged executables. (With the tagged-executables approach, when somebody ships a piece of software on a tape or floppy disk or whatever, instead of having one version, there would be several. Some scheme would be needed to enable the machine to figure out which of the versions to pull off, whether it was Intel, Motorola, PA-RISC, MIPS-based, whatever.) And then there are solutions in between.

OSF has selected six alternatives that span that range — actually neither of the extremes, they're within the middle of that range. We're testing the technologies to determine whether any of these adequately addresses this key issue. HP is one of the finalists, and we've picked a technology that we've been using for our compiler architecture for many years and submitted that as our entry.

The marketeers are extremely excited about this opportunity. It could change the face of the environment and deliver a new level of openness to the computer industry. The technologists are more skeptical. In fact, what we may end up doing is solving segments of this problem — in other words, scaling the problem down to make it more addressable. Perhaps you could solve the problem of running different versions of UNIX on one hardware architecture or solve the problem of one version of UNIX across all hardware architectures, and by scaling it that way, you might be able to come up with something that was more air-tight as a solution. But we're going to know in the next 30 to 60 days the results of OSF's technical evaluation, and we're all optimistic and anxious to see what comes back.

OSF Vs. UI

Feibus: What's happening in the wars between Unix International and OSF, the negotiations that were going on before, etc. Can you offer any insight about that?

Osaka: No recent salvos fired! Lately, I guess, there have been

no discussions going on as far as a merger of the two camps is concerned.

Feibus: If what OSF provides is more advanced than what AT&T will offer, why negotiate at all?

Osaka: It wasn't OSF's intention to subsume the System V technology at all. We didn't enter into the negotiations because we believed OSF was in a position of weakness and needed to merge with System V. It was more that we thought there were elements of strength from both sides, that the industry, customers and vendors would be better off if there weren't this battle. We looked for a way to merge the best of the two operating systems. As it turns out, I believe that OSF had a good proposal. We had some really good ways to bring both camps and their respective technologies together.

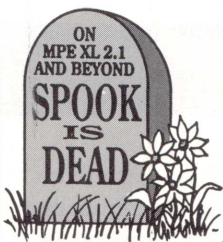
It was simple to draw a technology plan for the merged organizations. We could do that in five minutes on the back of an envelope. Those weren't the issues. What broke down the negotiations was less the substance and more the process. I was involved from an HP perspective and also from an OSF perspective in some of the negotiations. Now I know what it's like to work in the political process of government.

Maybe we ought to get an arbitrator like those who arbitrate union labor-management negotiations. We have all the

emotion and all the critical issues that those kinds of negotiations have—and we have more than two parties. We have OSF, we have UI, we have the vendor organizations that are members of both. We have several people that have different vested interests. In fact, I think one problem is that we also have two organizations, UI and OSF, as independent entities that have vested interests that don't run along the lines of "bring this stuff together." It's a very difficult political process to bring together.

But I'm optimistic that it's all going to work in concert in the future. I believe the OSF environment will become compelling, not only to customers, but to the vendors who are currently System V-based, and that they too will move to OSF eventually. I think the environment is being specified through the RFT process with the participation of both OSF and UI members and that X/Open is playing a middle-ground role and bringing some sanity to the specifications of standards. I think we'll not be talking about this debate in a couple of years. In fact, in a few years, the operating system won't matter. We'll be talking about other things like what the standard should be for object-oriented, multimedia... I mean, pick your layered technology that's above the kernel and — we'll be fighting about that.

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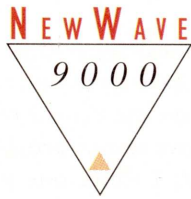
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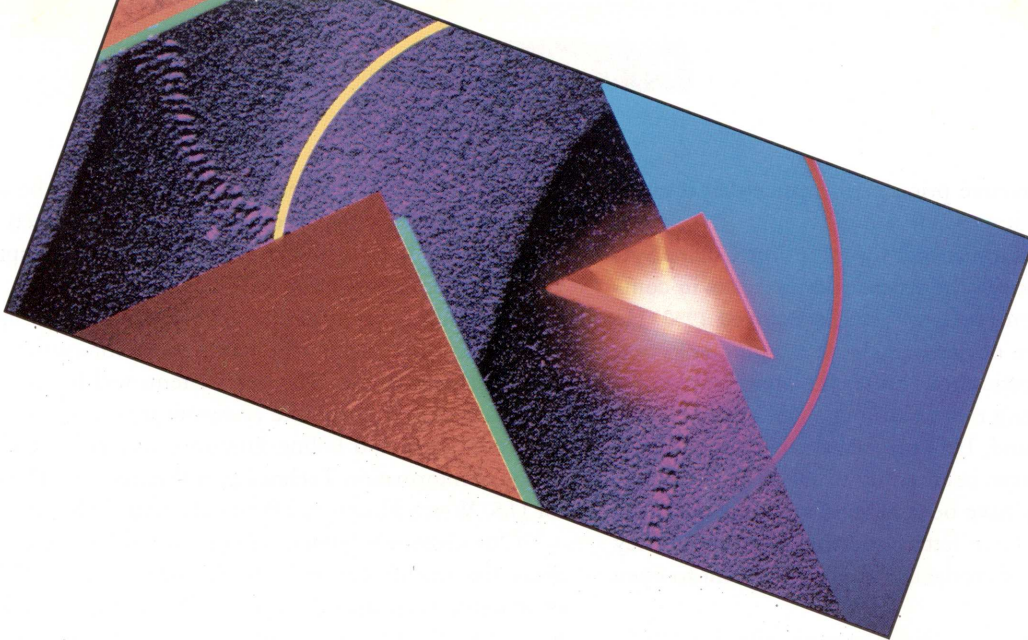
[BY BILL SHARP]

In A Year
That
Slumped,
HP's UNIX
Systems
Sparkled

Last year the computer industry had the sort of year that can put gray hair on a two-year-old. Naturally, this meant that grown-up computer management types began to look downright white-haired, wrinkled and stooped over. Company purchase orders were made out for gross lots of walking canes, and bifocal assembly lines worked overtime. It was a tough year in the industry, and '91 doesn't look like a rip snorter either.

But those wrinkled manager types still crack a smile now and then and make gleeful cackling noises when sales go their way. Just the other day, for instance, I got a quick rap on the ankle from an HP walking stick when a particularly good piece of news came down the pike. In fact, quite a lot of good news has surfaced recently concerning HP's sales of commercial UNIX systems. While I'm nursing my walking cane wounds from recent visits, I thought some of you might like to hear about HP's inroads into commercial markets.

Five deals in the last few months of 1990 ran into hundreds of millions of dollars in new sales outside traditional HP markets. The sales include:



Sells

- Several hundred million dollars in a worldwide licensing agreement with Northern Telecom for use of the HP-UX operating system, workstations, servers, minicomputers and fault-tolerant systems with telecommunications equipment.

- Twenty-five million dollars in a contract with U.S. West for 2,300 Series 400 workstations for customer service use.

- Fifteen million dollars for a contract with the Stock Exchange of Singapore to provide 1,600 workstations in client-server configurations for financial transactions.

- An unspecified amount from Boatmen's Bancshares Inc. for a network of more than 100 workstations, X terminals and servers to automate investment trading and sales operations.

- An unspecified amount from BellSouth for workstations, X terminals, servers, multiuser systems, peripherals and networking products for use by the worldwide telecommunications company in a new corporate computing system. No other details were released on this deal. BellSouth serves 70 percent of the population in nine southeastern states.

These deals are just the peaks in the skyline. Across the commercial UNIX horizon, HP's outlook is consistently good.

In fact, on a clear day, you can see Europe in 1992, expansion in the Asian Pacific, and beyond.

A Friendly New Market

THE GOOD NEWS FOR HP extends far beyond the number of units sold or dollars brought into the company. All five of these major sales are for substantial numbers of units in markets where HP workstations have been all but unknown. This is further evidence of a strong movement away from centralized, proprietary mainframes, and toward more open, decentralized computing.

Commercial computing installations are less governed by lust for that last screaming mips than by concern for the bottom line, safe investments and good service. Growth in these commercial markets will be more rapid than growth in the rest of the UNIX marketplace.

The good news for users of HP UNIX systems is that the expanding market for UNIX in general and HP in particular will

encourage the same attractive price/performance that is available now, and probably improve it.

Karl Freund, marketing manager for HP's Fort Collins Systems Division, helped create the recent sales successes in commercial markets and seems to have actually enjoyed 1990. He doesn't sound at all worn out or wrinkly on the phone. In fact, he sounds quite enthusiastic about his team's latest exploits.

"I think we're winning more than our share of these commercial deals," says Freund. He's especially excited that "some of the really big deals have been going to HP. These are customers that traditionally have been aligned with that company whose logo consists of three letters and the color blue. They see in HP a broad range of products and a commitment to open systems."

Analysts have predicted a faster growth rate for UNIX workstations in commercial markets than elsewhere, says Freund. "The rate of sales will build up to a very healthy growth rate. IDC is predicting 60 percent, and our commercial sales will be at market rate or better."

Switchers Switch To HP-UX

A HEFTY CHUNK OF that growth will involve Northern Telecom (NT). As a major supplier of digital switching systems globally, the \$6-billion vendor of telecommunications gear represents a great deal of business. NT will convert its switching systems to use HP-UX as its operating system for current DMS SuperNode systems, as well as new S/DMS fiberoptic transmission and S/DMS broadband switching systems.

NT expects "tighter integration of general purpose computers and telecommunications systems, allowing telephone companies to connect HP and other manufacturers' workstations and minicomputers." Use of UNIX also will reduce development costs for applications software for use with the

switching systems. Northern Telecom expects to be using HP-UX on its transmission, access and switching products this year.

U.S. West is the primary telephone service company in 14 western states, representing \$25-billion in annual sales. The firm is decentralizing its customer service systems to improve response times and make its systems easier for customer service representatives to use. The new systems will be used as front-end workstations for phone company representatives handling service requests and billing inquiries, says Fred Ledbetter, director of Information Technologies Planning and Development for U.S. West's Home and Personal Services Division.

"Our customer service representatives are connected with about five mainframe applications, and there are different ways of working with them," he says. "With one in particular you have to go through 24 screens to get four things done. One of the first things we wanted to do was to protect our service reps from that."

"This new system combines some distributed processing with a surround approach to provide a consistent user interface. So rather than have the system drive the employee when the call comes in, the customer can drive the conversation. These are practical things for the rep to use in the format they need, so they can concentrate on solving the customer's problem rather than on the computer."

Ledbetter expressed minor irritation with lagging deliveries of Series 400 systems, but seems pleased with HP and the decision to use HP workstations. "We wanted something that optimized performance across the board," he says. The workstation has to be fast, and the servers and communications software have to be fast. HP had quite a few problems working with communications boards from a third party, but they worked them out."

He also says the systems had to be OSI compliant, "a stated direction for U.S. West." And naturally, price was an issue. "A couple of hundred bucks per seat makes a difference when you buy this many [2,300]." HP got extra points for diagnostic sup-

[JOINT VENTURE IN THE MAKING?]

U.S. West and HP appear to like working together, and they know a good market when they see one. Fred Ledbetter, director of Information Technologies Planning and Development for U.S. West's Home and Personal Services says HP and U.S. West are looking at the commercial viability of marketing the customer service system they have developed together.

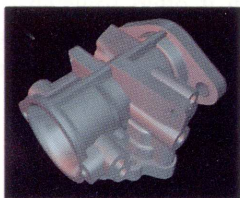
"The application seems to be consistent where you have a large number of customer service people trying to communicate with customers," he says. "This has been kind of a leading edge, putting the processing power at the rep's desk rather than back in the mainframe. It has been a real interesting migration, trying to fit our needs and the technology together in an appropriate solution."

"We've had enough inquiries about the system that we are looking at its commercial viability. U.S. West can't do it alone, but with a hardware vendor and systems integrator we might be able to do something," Ledbetter says. U.S. West is looking at the software to determine what investment is necessary to turn it into a viable product rather than an internal company solution.

We're working with HP and Price Waterhouse to see if we can put together a joint partnership to go forward with this, but nothing is really set yet. We hope to make a recommendation by December as to what the potential is in the market. Three potential customers are coming in at the end of November and that will give us a clue as to what the potential is."

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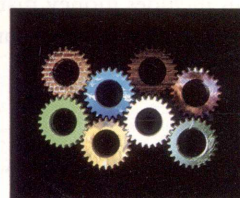
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port and maintenance. Says Ledbetter, "If you have this many systems and they're spread out, you need somebody with some history of supporting products remotely."

U.S. West chose HP from an initial list of 27 vendors for the first third of a large computer expansion. Some of the remaining business will go to a second vendor to be chosen this year. "We feel competition really keeps people on their toes," says Ledbetter.

Workstations Replace PCs

FOLKS AT THE STOCK Exchange of Singapore (SES) just can't get enough of HP it seems. Since 1988, they've had 60 HP 9000 Series 800 systems at the exchange and at brokers' offices to support a network of 1,600 PCs functioning as order processing stations. Now the PCs are on the way out, to be replaced by diskless HP 9000 Model 425t systems in several hundred clusters. Windowing capability and the upgradability of the Series 400s were factors in the decision.

Automated trading is also the reason for workstation purchases by Boatmen's Bancshares Inc. Boatmen's selected InTrader from Digital Solutions Inc. as the basis for a network linking three trading floors and 16 U.S. sales offices. InTrader is a UNIX-based online software system for managing front- and back-office trading operations. DSI, in turn, recommended HP's NewWave, with 68 HP Apollo 9000 Series 400 workstations, 62 HP 700/X terminals and two HP 9000 Model 645 database servers.

InTrader will use multiple windows to integrate processing of Boatmen's trading, custody and portfolio-management activities online. This includes money markets, fixed-income securities, asset- and mortgage-backed securities, foreign-exchange trading and equities trading.

Competition Still A Factor

HP'S FREUND FINDS that the most significant difference in commercial customers is that they're much more likely to be thinking on a large scale, and therefore, must be more careful about their purchasing decisions. "When a customer changes his computing topology, he's taking a big risk because he thinks it will make him more competitive," says Freund. "Commercial customers approach their purchases from a competitive business perspective, not according to the type of processor. 'Will it do the job and can I grow with it?' That's what they ask themselves."

Commercial customers tend to concentrate on security, quality and service, says Freund. "As a whole, the people you're dealing with at commercial sites are running MIS departments and they look at total cost of ownership."

One factor that doesn't change when you move into new

**HP's UNIX-based
systems are clearly hot stuff
in commercial markets,
for workstations as well as
multiuser systems.**

markets is competition. HP is far from alone in trying to cash in on distributed systems. But if Freund is right in stating that HP is getting more than standard share of this business, what are the reasons for this competitive advantage? Freund says the answer to that question varies from vendor to vendor. His impromptu assessment of HP's major competitors is as follows:

IBM—"It just can't hit the price points today," he says. "A lot of customers are more sensitive to price per seat than price per mips. IBM systems are tuned to very high performance, with a bottom price of about \$13,000. Until it hits those lower price points, people just can't buy IBM."

Sun—"It can hit the price points, but it doesn't have the demonstrated track record in non-technical markets that HP has, or the level of quality and service that these customers expect. In some of these applications, reliability and uptime are mission critical."

DEC—"It has demonstrated a wavering commitment to open systems, though it offers somewhat more, now. HP's early commitment to open systems is paying off. If DEC were measured only on the price/performance of its systems, it would have more sales."

Commercial Growth Spurt Will Continue

FREUND SAYS MORE large commercial deals are on the way for HP, hinting that at least one each will be announced from Canada and Australia soon. In addition, he says some suppliers and customers of the companies involved in recent deals also will move to HP products.

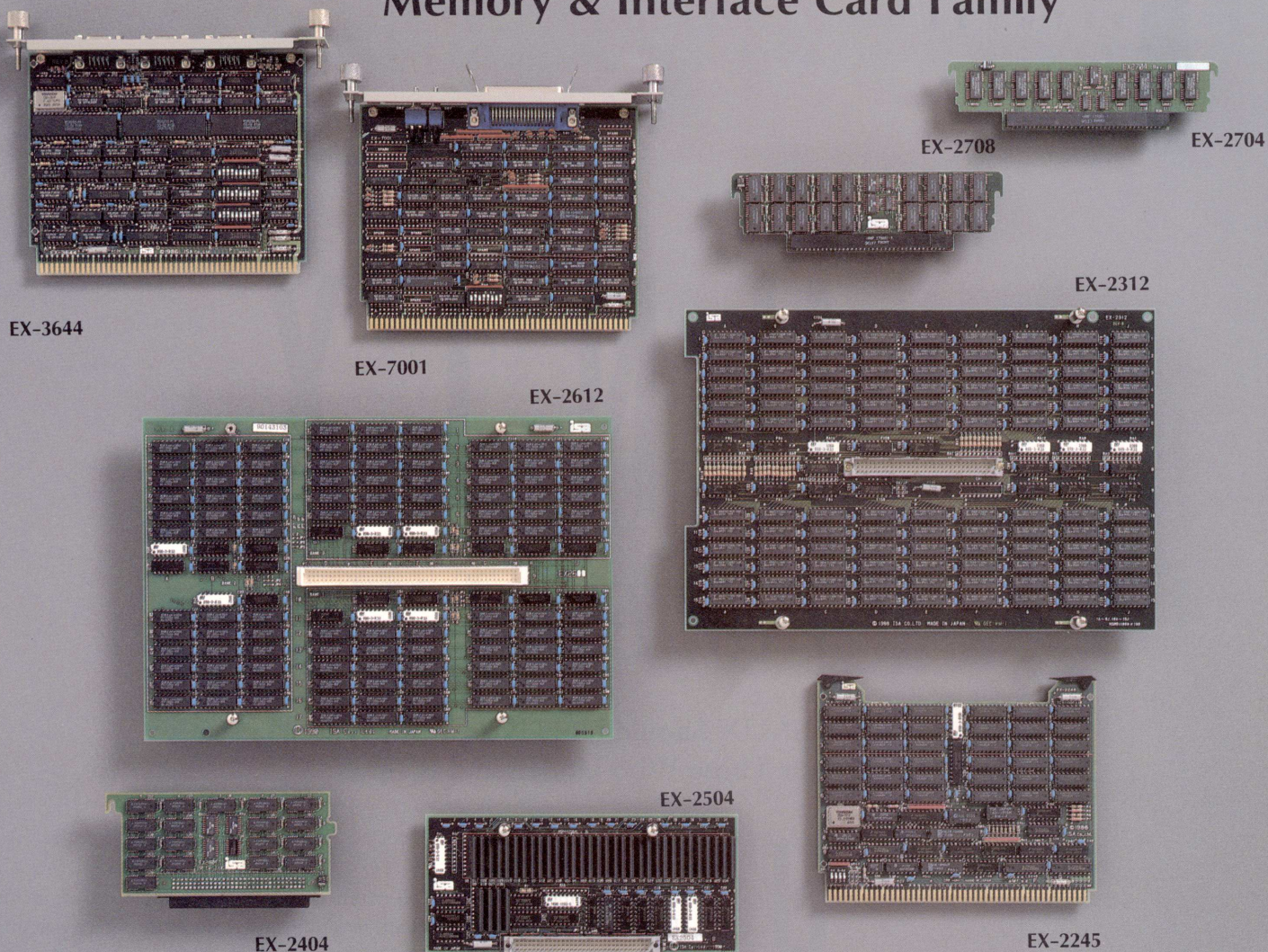
A bad year for the industry doesn't necessarily mean tough times for everybody. HP's UNIX-based systems are clearly hot stuff in commercial markets, for workstations as well as multiuser systems. And while HP's UNIX team has probably sprouted a crop of gray hair along with everybody else, they still wield a wicked walking cane.

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EX-2404	4MB	340	HP98268A	PARITY
EX-2501	1MB	332	HP98269A	
EX-2504	4MB		HP98269B	PARITY
EX-2604	4MB		HP98267A	
EX-2608	8MB	360	HP98267B	PARITY
EX-2612	12MB		HP98267C	
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CIRCLE 245 ON READER CARD

UNIX

For Real-Timers

HP-UX Should Hold No Great Mysteries
For Those Who Understand RTE-A

U

NIX has found its way into all manner of computing applications, including those traditionally associated with real-time and manufacturing environments. Long believed to be the exclusive bastion of HP 1000s and RTE, these environments now are being integrated with applications running on HP 9000s and other systems. Consequently, many of you who are already familiar with the intricacies of RTE-A are now being asked to learn the cryptic ways of UNIX.

But don't worry, HP-UX is just like RTE-A. Really! Actually, it's probably more accurate to say that all operating systems provide basically the same services. Viewed in terms of these common services, HP-UX and RTE-A are more alike than different.

Let's look at the basic chores of an operating system. When a computer is turned on, the boot programs load the operating system (OS) into memory. The operating system, in turn, initializes system hardware and software. Once the computer is up and running, the operating system provides two key services: a file system for storing programs and data, and an environment in which to run programs.

When users log onto the system, the operating system controls what resources they may use. When users run programs, the OS provides a way to pass parameters or arguments, which control the programs or tell them what data to act on.

When an RTE-A system is turned on, it performs power-on self tests (PTESTs) and then determines the boot configuration from hardware switches on the CPU and I/O cards. The most common boot configuration enables the Virtual Control Panel (VCP) on the first

[BY CHRISTOPHER NELSON]

terminal of the multiplexor at select code 23 octal. From the VCP prompt, the operator may execute low-level commands including selecting the system image to boot.

When VCP is told that the system is to be booted from disk, code in the boot ROMs locates and transfers control to the boot extension (BOOTEX) which, in turn, executes the boot command file. The boot command file mounts system disk volumes, loads vital programs and specifies the program that will complete the system start-up by initializing hardware and software subsystems.

When CI, the RTE-A command interpreter, is used as a start-up program, it processes commands from a Welcome file found in the SYSTEM directory. The Welcome file contains commands to mount user and application disk volumes, set the system time, initialize user terminals and special hardware (like programmable interfaces), and start subsystem software (like the IMAGE database or DS network).

When a PA-RISC system, like the HP 9000/835, is turned on, it performs self-tests and then reads the boot configuration from "stable storage." The boot configuration information includes the I/O paths to the system console and the "boot device." Next, the Initial System Loader (ISL) is loaded into memory from ROM. Like VCP, ISL allows you to specify the system to be loaded. It is, however, quite a bit more sophisticated or "friendly." ISL provides some prompting for user input and allows more verbose, less cryptic input than VCP.

When a system and boot path are specified, ISL loads the bootstrap program from the boot area. The bootstrap program then loads the kernel from the root partition. As HP-UX loads, it finds and identifies system memory, interfaces and storage devices. Various information about these resources is displayed at the console. After the root file system is mounted, **/etc/init** is scheduled to initialize the system. The file **/etc/inittab** (initialization table) is used to tell **init** how to initialize various devices.

After completing certain low-level functions, **init** schedules **/etc/rc** (run command) to perform various, system-specific start-up functions. These include scheduling daemons and starting up subsystems like NS or ARPA network services. Generally, **/etc/rc** calls other scripts to perform these tasks. For example, **/etc/netrc** might be used to start up network software and **/etc/rc.local** might perform various, local functions.

The File System

OWING, IN PART, TO its heritage of File Manager cartridges, the RTE-A file system explicitly acknowledges and displays information about the disk or LU (logical unit) that files and directories are stored on. Global directories may be explicitly created on an LU (or may default to the first mounted LU), and all files must be under a global directory. HP-UX, on the other hand, generally doesn't allow the

The real-time nature
of RTE-A makes program priority
a very important part of process
management. HP-UX is an interactive,
transactional system with a different
scheduling philosophy.

user to see what physical device a file resides on. After the system is booted, additional storage devices may be "mounted," grafting their directories onto the root of the boot device.

RTE-A supports two types of file permissions: read and write. Both may be set for the file owner, the owner's group, and for other users. Because groups are reasonably recent additions to RTE-A and many HP 1000 systems have only **NOGROUP**, permissions to the owner's group may not be particularly useful.

HP-UX supports three types of file permissions: read and write (as in RTE-A) and execute. Execute permission is useful in two ways. First, it allows you to give *others* execute permission for a script (command file) without allowing them to read the text of its contents. Second, because text files generally are created with no execute permission given, it can be used as a file attribute preventing normal text files from being accidentally interpreted as scripts. (In RTE-A, any text file with a **.CMD** extension is implicitly a command file, and *any* file can be explicitly executed with the TR command.)

The programs **OWNER** and **PROT** allow file ownership and permission to be changed under RTE-A. In HP-UX, the collection of read, write and execute permissions are called the "file mode," which can be changed with **chmod** (change mode). Ownership and group associations can be transferred with **chown** and **chgrp**.

Through various accidents, files and directories can become corrupt. HP-UX is especially susceptible to corruption because a great deal of disk information is buffered in memory and system crashes can keep this information from being posted as it would be in an orderly shutdown. In RTE-A, the **FVERI** (Format VERIfy) utility can be used to check for corruption, but repairs must be made manually by deleting files or moving all the files on a volume onto tape and re-initializing the volume. HP-UX provides a more complete solution in **fsck** (File System Check). This program is generally run as part of system start-up but also may be run interactively if the need arises.

It not only checks for corruption but deletes errant files and does its best to put things in order.

RTE-A's LU-oriented file storage makes managing free space an important duty. The **FREES** (FREE Space) utility can be used to display how many free blocks are on each mounted LU. Although the HP-UX file system is less physically-oriented, files can't span physical devices. Messages like "file system full" sometimes will be generated, especially if the **/tmp** directory gets full of old log files. The **df** (disk free) utility will report the number of free blocks and file pointers (called i-nodes) on a file system. The **du** (disk usage) command can be used to tell how many blocks are used by a directory or subdirectory.

The Execution Environment

BOTH RTE-A AND HP-UX allow programs to run in the foreground (requiring the user to wait for one program to complete before running another) or background (allowing the program to run unattended while the user continues with other work). In RTE-A, a program scheduled with the **RU** command is run "with wait" (i.e., in the foreground) and a program scheduled with **XQ** is run "without wait" (in the background). In HP-UX, commands are normally run in the foreground but may be put in the background by appending an ampersand ("**&**") to the command string (e.g., "**sort data > out &**").

In RTE-A, a program runs in an ID segment, which can be uniquely identified with the five-character program name and session number. HP-UX assigns a globally unique Process ID to each program. This PID is the only way to manipulate programs in HP-UX. RTE-A provides information on currently active programs with the **WH**, **whatiz**, utility. HP-UX uses the **ps**, process status, command. In combination with other utilities, like **grep**, **ps** provides much more flexible access to process information. For example, **ps -ef | grep uname** would report only those programs run by user **uname**. This would include multiple sessions that **uname** may have started on different terminals.

The HP-UX equivalent of **OF** is **kill**. As mentioned above, the PID must be used to kill a process. A key difference between **OF** and **kill** is that **OF** instructs RTE-A to flush the program's ID segment; the program itself isn't involved in the termination. By contrast, **kill** sends a terminate signal to a program. This gives the program an opportunity to clean-up after itself but means that a program that is I/O locked, or can't continue for some other reason, may never receive the signal to terminate.

The real-time nature of RTE-A makes program priority a very important part of process management. HP-UX is an interactive, transactional system with a different scheduling philosophy. In short, HP-UX process priority is dynamic and is managed by the OS in such a way that interactive programs are

favored over background programs. There are exceptions to this, and HP-UX on the 800 series provides for a measure of "real time," high priority process scheduling, but from the user's perspective, there's basically no way to control process priority.

Both RTE-A and HP-UX allow arguments to be passed to a program when it's invoked but the way the run string is handled by the operating system, and the way that arguments are accessed by programs, are very different.

A "properly formed" RTE-A command line is all uppercase, contains no blanks and has parameters separated by commas. As the system evolved, the command interpreter became more forgiving and now allows blanks and mixed-case in command lines but edits them into proper form before passing them on to programs or command files. Programs retrieve their parameters through the system calls to **RMPAR** and **RCPAR**. Command file parameters are placed in special environment variables named \$1-\$9.

One of the peculiarities that HP-UX inherits from UNIX is case sensitivity. This catches many users unaware when moving from more forgiving operating systems like RTE-A or MS-DOS. Although it requires lower case, HP-UX does compress strings of multiple blanks before passing command lines to programs or scripts. Programs may use the special program variables **argc** (argument count) and **argv** (argument variables). Script parameters are placed in special environment variables \$1-\$9, though more than nine variables can be accessed using the **shift** command. HP-UX programs also may pass data to other programs by means of pipes.

User Accounts

HP-UX AND RTE-A SHARE a similar accounting structure of users and groups, but they manage these accounts very differently. RTE-A keeps one file for each user and group in the **USERS** directory. These files are managed by **GRUMP**, the Group and User Management Program. Generally, **GRUMP** is used only by the System Manager and users can't even reset their own passwords.

In HP-UX, all group and user information is stored in a single file, **/etc/passwd**. This is a text file that may be edited (with **vi**, **ed**, etc.) or managed through **SAM**. When editing **/etc/passwd**, the password field is left blank. The **passwd** program is used to add an encrypted password to the file after the account is created. Users also may reset their own passwords with **passwd**.

Common features of HP-UX and RTE-A accounts include username, user and group IDs, login directory, and start-up command. These are called by somewhat different names and used somewhat differently on each system.

In HP-UX, the user's login directory also is called the home directory. Executing the **cd** (change directory) command without any parameters, changes to the home directory. (The

ANALOGOUS COMMANDS		ANALOGOUS FILES		ANALOGOUS DIRECTORIES	
RTE-A	HP-UX	RTE-A	HP-UX	RTE-A	HP-UX
VCP	ISL	BOOTEX	init	/SYSTEM	/etc
PROT	chmod	SYSTEM	inittab	/PROGRAMS	/bin
OWNER	chown, chgrp	WELCOMEN	rc	/SCRATCH	/tmp
FVERI	fsck	/USERS/@	/etc/passwd	/LIBRARIES	/lib
FREES	df	@.ANS	/etc/conf/gen/S800		
FOWN	du	RTAGN	uxgen		
WH	ps				
OF	kill				

Table 1. RTE/HP-UX Comparisons.

pwd [print working directory] command is like using **WD** with no parameters in RTE-A.) In RTE-A, there's no built-in home directory, though the concept can be implemented with command files and environment variables.

The only command interpreter, or shell, included with RTE-A is CI. However, the user's start-up command may be a menuing program (like PMIS's OP) or a directly-scheduled application. In HP-UX, there are more options, including the Bourne shell (**sh**), the Korn shell (**ksh**), and the C shell (**csh**) — all with slightly different features that appeal to different users.

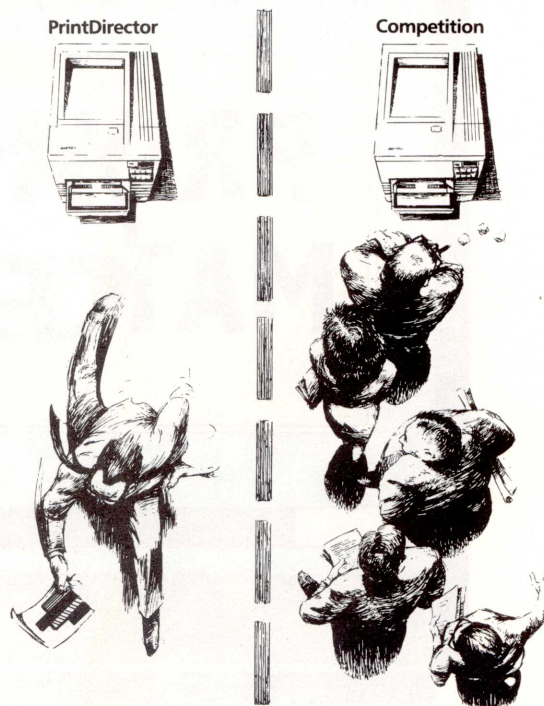
If CI is used as the start-up command under RTE-A, a command file may be specified to be processed before user input is accepted (for example, **ru,ci,/cmdfiles/logon.cmd**) This log-on command file feature is built into the HP-UX shells, which look for "profiles" containing commands to execute at the beginning of the session. For **sh** and **ksh**, the global profile is found in **/etc/profile**, and user-specific commands are in **\$HOME/.profile**; where **\$HOME** represents the home directory. For **csh**, the global profile is **/etc/csh.login**, and user-specific commands are in **\$HOME/.cshrc** or **\$HOME/.login**. Note that a leading dot (.) generally suppresses the display of a file's name in directory listings essentially making **.profile**, **.cshrc**, and **.login** "hidden" files.

UNIX-derivative operating systems can be intimidating to first-time users. The system prompts and responses are terse and input formats cryptic, but verbose user manuals almost make matters worse. You can protect yourself from some of this with sophisticated applications that hide the operating system, but system managers must still deal with the system on its terms. Hopefully, these RTE/HP-UX comparisons in *Table 1* will make UX seem like more familiar territory. —Christopher Nelson is president of S/Wizardry Ltd., Troy, NY.

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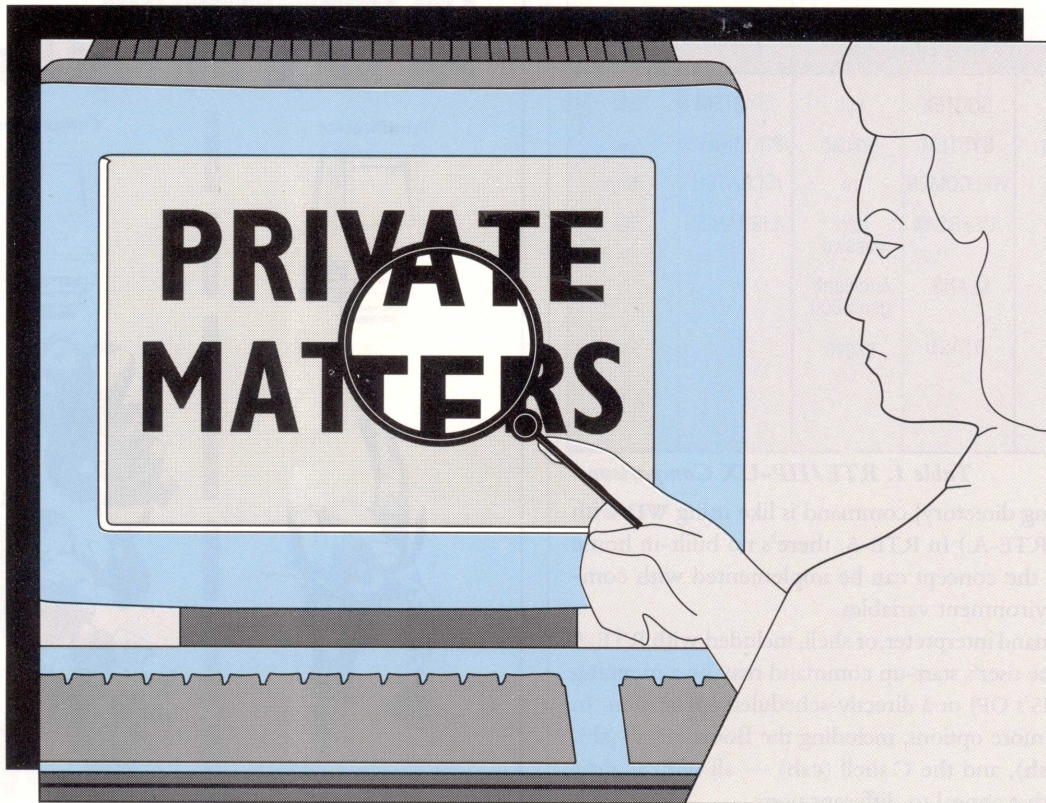
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CIRCLE 166 ON READER CARD



Operations Control Systems' PRIVATE Wards Against System Security Woes

"No one can build his security upon the nobleness of another person."
— Willa Cather

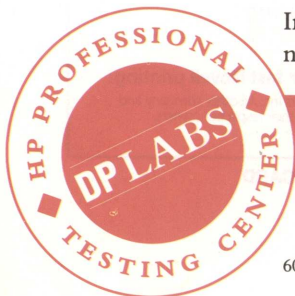
"...for the security of the future I would do everything." — James Garfield

It's a safe bet that Willa Cather and James Garfield never dreamed of, let alone saw, a computer. The MIS or system manager who ignores their advice, though, is destined for a short career. In a perfect world, there would be no need for security. However, in a world

with hackers, the potential for disgruntled employees, vast communications networks, industrial espionage... You get my point.

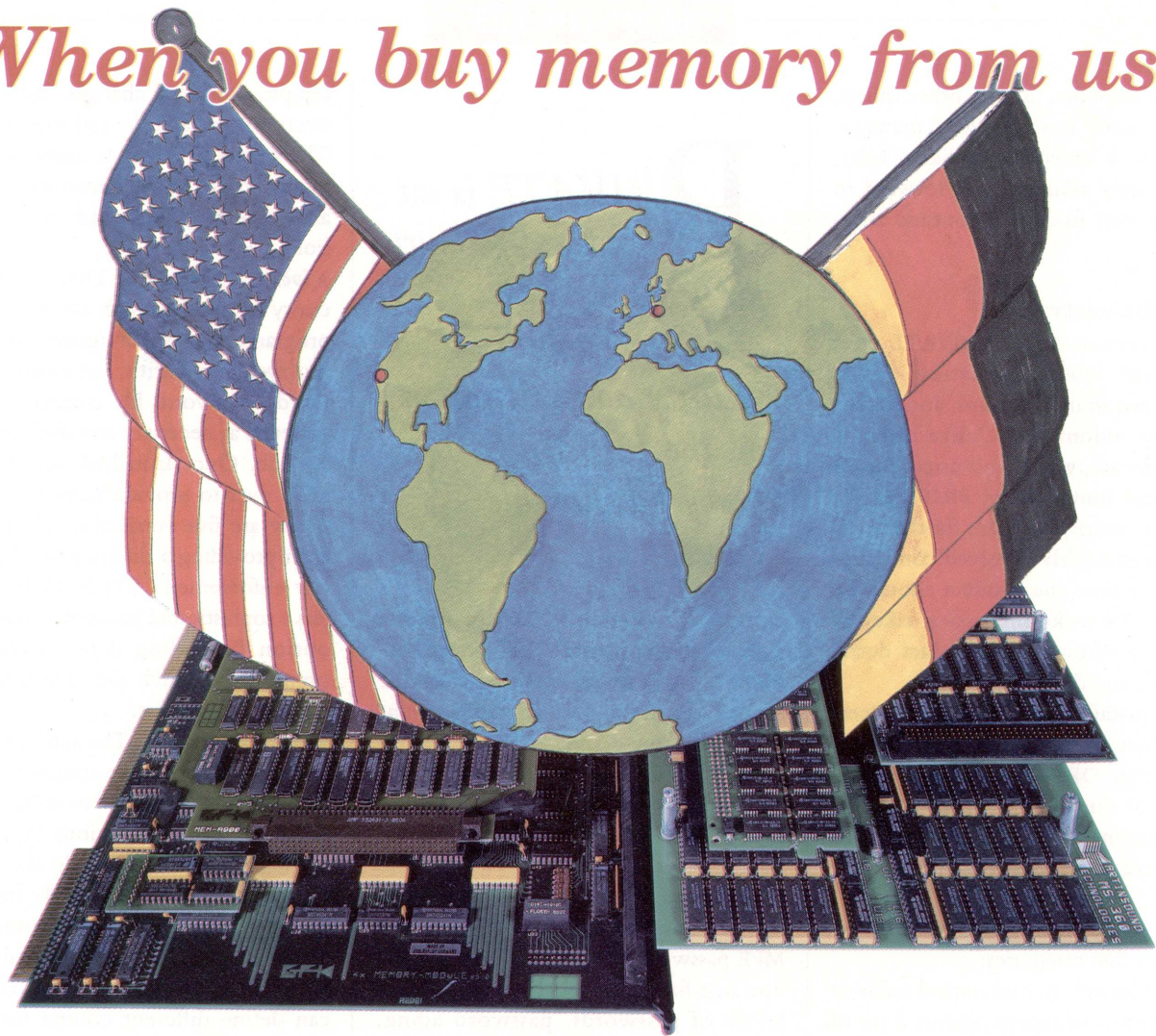
I know it's hard to get excited about security software. It isn't fashionable or glitzy, and often it seems more of an obstacle than an aid for efficient system management. However, if you value your career, you should appreciate this silent partner.

PRIVATE from Operations Control Systems (OCS; Palo Alto, CA) is a security administration system for the HP



By John P. Burke

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3000 that provides, among other things, access control and password management. It will let you sleep like a baby, and you may actually look forward to that next visit from your outside auditor.

Test Administration

I tested version 4.0 of PRIVATE on a Classic HP 3000. Installation of the product was straightforward, and for the most part, automated. Unlike ordinary utility software, which you usually crank up and use immediately, PRIVATE (or any other security software for that matter) requires a fairly involved configuration step before the product should be activated. To make this easier, take the time to go through the product documentation and demo.

One installation note: Any access control system for the 3000 has to use UDCs with OPTION LOGON, NO-BREAK. If this conflicts with anything you're currently running, you'll want to investigate interface questions thoroughly.

PRIVATE's main features are organized into five categories:

■ **Access Control.** Access control refers to the validation of logons against a set of rules called profiles. A session- or job-failing validation can be terminated automatically and a history of the failed attempt logged. The rules are applied at the system, account, user, group, session/job name, port or individual levels or any combination of levels. PRIVATE makes use of the MPE password system for accounts, users and groups and then adds two additional (and optional) password checks: port passwords and personal questions. Port passwords are particularly useful for limiting access through remote ports.

PRIVATE allows you to define a user by the logon (User ID) or by who they are (Personal ID). A User ID can be either the full logon:

```
(sessionname,user.account,group)
```

or the logon with wildcarded session and/or group name, e.g., @,user.ac-

PPRIVATE is an excellent product for bringing order and accountability to security administration on the HP 3000. It's powerful, flexible and solid.

count,@. A Personal ID is a unique eight-character identifier. For each Personal ID, you assign a set of allowable logons. Personal IDs are convenient when you have individuals regularly using multiple logons.

Access can be limited by time of day, type of day (work vs. non-work) and port or range of ports.

■ **Password Management.** Password management works with the existing MPE password scheme but then takes it one step further by providing two extra levels of passwords, password aging, configurable password format requirements, online changes, initial system passwords, password expiration warning messages and audit trails.

■ **Audit Reporting.** The audit reporting feature tracks all logons and access at-

► As good as PRIVATE is, don't assume that you can let it do all the work for you. Strong security still requires vigilance and diligence. For example, SM or PM users can subvert even the most elaborate security system. Furthermore, you still have to design, monitor and adjust as necessary the security matrix for your system. What PRIVATE does (and does very well, I might add) is give you the tools you need to do a good job of security administration.

tempts, password changes, auto logoffs, override transactions and inactive users. The system generates security documentation, logon and maintenance histories and reports on attempted security violations.

■ **Jobstream Security.** The jobstream security feature (through the STREAMER program) checks jobs against the operating system security, substituting lockwords, passwords file contents, and parameters as necessary and then launching the job. Once launched, access control takes over to provide further validation. There are five versions of STREAMER, each providing a different level of security enforcement. STREAMER also offers a sophisticated parameter substitution option (including date formulas and prompting), which allows you to create generic job streams.

■ **Automatic Logoff.** The automatic logoff feature can terminate inactive sessions. (You define what inactive means.) It also terminates jobs or sessions that are accessing the system outside the allotted time window. An extremely important aspect of the auto logoff feature is the ability to exclude specific logical devices or programs from termination. Also, you can define different criteria for block-mode and character-mode access.

For security-sensitive applications, PRIVATE includes a programmatically callable routine (OCSVERIFY) that enhances application security by revalidating the user's answer to the logon personal question.

PRIVATE allows you to specify exceptions to your access control rules. For example, MANAGER.SYS is a predefined backdoor in that the access control program normally bypasses all validation checks. Of course, you can lock this door if you want. Furthermore, you can direct PRIVATE to ignore certain levels of access control checking for other logons.

PRIVATE allows you to enter one-day overrides to documented access control rules. You can override values for port, account, User/Personal ID and group validations. Only the security administrator or security operator can issue

overrides. Override records are valid only on the specified date.

No Free Lunch

Because PRIVATE seemingly tries to accommodate every conceivable situation and desire, learning to use it can be a bit trying, and mistakes are certainly a possibility when setting up the initial security profiles. For example, be very careful with the AUTOLOGOFF feature.

OCS provides an excellent demonstration and tutorial, which, again, I highly recommend you take the time to work through. Start out with a simple security configuration (unless you enjoy getting calls in the middle of the night). Remember, if you have little in the way of security now, even simple password control will be a major improvement. As you become more comfortable, expand your security blanket to cover an ever larger area.

What About Performance?

Performance is a consideration with access control because the load occurs at logon. If your logons are poky now, any security provisions you add will slow things down. On our test system, which usually is very heavily loaded, PRIVATE increased the CPU seconds required for logon by 2 1/2 times. Wall-time varied significantly depending upon load and occasionally became excessive.

Logons are a very system-intensive activity. Of necessity, any access control scheme must validate the user's authority at logon. PRIVATE performs about as well as could be expected. Any security system faces the same dilemma with access control. OCS recognized this problem and has provided a means for compiling a security matrix and achieving faster logon validations. In an unscientific test, this "Turbo option" improved our logon performance by about one-third.

Of course, you need a stable system to use the Turbo option, though the scheme provided by OCS gets high marks for being extremely well thought out. It's flexible enough to easily handle most production shops. If your logons take an acceptable amount of time under normal

conditions, PRIVATE probably won't create any problems for you.

Documentation for PRIVATE comes in a single 431-page loose-leaf manual. It's professionally prepared with numerous figures and tables. A nice feature is the way important notes are highlighted. I especially liked all the flow diagrams detailing the decision processes for each type of validation.

PRIVATE is an excellent product for bringing order and accountability to security administration on the HP 3000. It's powerful, flexible and solid. Considering the complexity of the task PRIVATE performs, it's a relatively easy application to master.

Editor's note: PRIVATE now offers a security audit option, the PRIVATE Audit Facility, to help protect your system's integrity. It takes a snapshot of your system at scheduled intervals or at your request. The picture produces a report on your system's security weaknesses. It identifies when user's access rights don't match their capabilities, when unauthorized users can access sensitive files, when there are problems with released files containing passwords and when there are jobstreams left unsecured. The report lists weaknesses by vulnerability and by account. It also gives you an overall system security score to let you track security improvement. ■

PRIVATE

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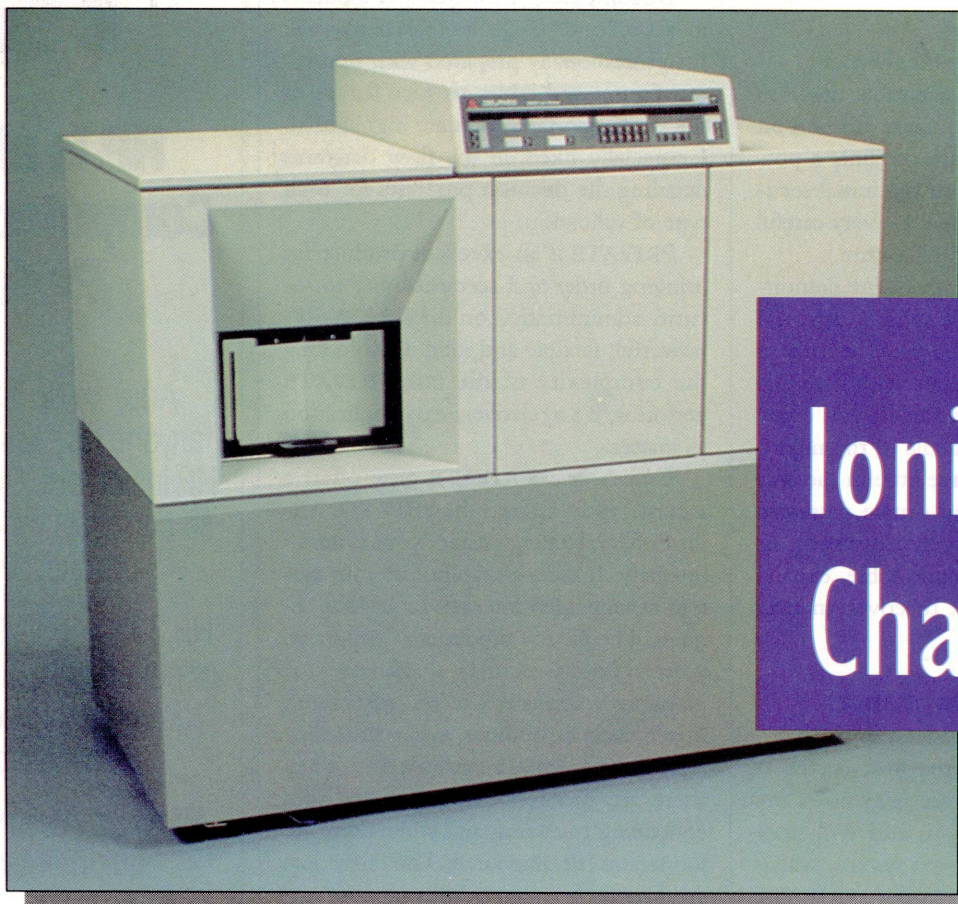
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CIRCLE 101 ON READER CARD



**Ionically
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Oak Grove Systems LZR-75-L25X Printer Delivers 75 Pages Per Minute

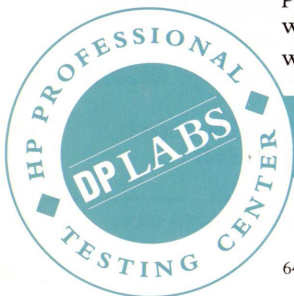
Most printers can be classified in one of two ways—impact or non-impact. Impact printers include traditional daisy-wheel and dot-matrix printers—those popular replacements for the electric typewriter. The best known variety of non-impact printer is the laser printer. But within the past eight years, a new non-impact technology known as ion deposition has begun to emerge.

Unlike a laser printer, which hot-fuses toner to the paper, the ion deposition process uses a cold-press technique, which allows it to consume less power when printing. One ion deposition

printing system available for your HP 3000 and HP 9000 computers is the LZR-75-L25X Printing System distributed by Oak Grove Systems (Menlo Park, CA). This system includes the LZR-75 Ion Page Printer, the L-25X-2 protocol converter, and Formmaker II — software for your PC that lets you create your own forms and download them to the LZR-75.

The LZR-75 Ion Page Printer is a high-speed, ion deposition printer capable of printing up to 75 letter-size pages per minute, with a resolution of 240 x 240 dpi. It prints in landscape or

By George T. Frueh



portrait mode and has a paper input and output sheet feeder, with a 1,500 sheet capacity.

The Ion Printing Process

The LZR-75 uses the Delphax ion printing process as its means for reproduction. In this process, the printer receives binary data from the host computer and uses text and format commands to form an electrostatic image.

The ion print cartridge generates the image by focusing a stream of negatively charged particles onto a rotating image drum. Once the electrostatic image has been placed on the image drum, it's developed with a magnetic toning system.

The printer's transfix system transfers and fuses the toner to the paper. Pressure is applied to the image drum by a pressure roller, and a sensor detects the paper as it enters, allowing proper synchronization of the image to the paper. A steel blade then scrapes off any residual matter on the image drum, and deposits it in a removable toner catcher tray. Finally, an erase rod erases any residual electrostatic charge on the drum.

Installing The LZR-75

The LZR-75 definitely doesn't fall into the category of desktop printers. Weighing in at 600 pounds, this printer measures 50 inches high, 52 inches wide, and 27 inches deep. It requires a dedicated, single-phase, 115-VAC/60-Hz or 230-VAC/50-Hz, three-wire power connection.

We wheeled the LZR-75 into our lab and maneuvered it next to our HP 3000 Series 37. To connect the printer to our system we used the L-25X-2 protocol converter. This protocol converter enables HP 3000 and 9000 users to connect a variety of printers directly to the Hewlett-Packard Interface Bus (HP-IB) using the standard system parallel line printer spooler.

The L-25X-2 supports both HP 3000 and HP 9000 PA-RISC systems (supported operating systems include MPE V, MPE XL and HP-UX). Because the L-25X-2 emulates the HP 256X family of printers, all procedures are handled in the

same way as an HP-supplied 256X printer.

Before connecting the devices, we configured the HP 3000 to support an HP 2566 printer. We assigned to the printer the HP-IB address four and selected the driver HIOCIPR0 as the printer.

We plugged the LZR-75 into a 120-VAC outlet. The printer has a circuit breaker that should be left in the "on" position to maintain stand-by power. This insures that the printers heaters will provide adequate imaging capability.

Once the printer was warmed up (approx. 20 minutes), we performed a self test to ensure that it was operating properly. To print a test pattern, you first press the Stop button on the printer-control panel to take the printer off line, then press the Extra Function button and enter 81 on the printer's keypad. This code enables the print-mode test.

Before connecting the printer to the L-25X-2, parameters need to be defined and stored within the memory of the L-25X-2. These include the printer type and GP-IB address, the interface type and the Vertical Format Unit (VFU).

You can set these parameters using the function keys located on the front panel of the L-25X-2. The front panel displays the operational status of the printer and allows configuration of the system. The

LZR-75-L25X PRINTING SYSTEM

PLATFORMS: Supported by HP 3000 running MPE V or MPE XL, HP 9000, Wang and IBM computers.

PRICE: \$63,695 includes the LZR-75 Ion Printer, the L-25X-2 protocol converter and Formmaker II.

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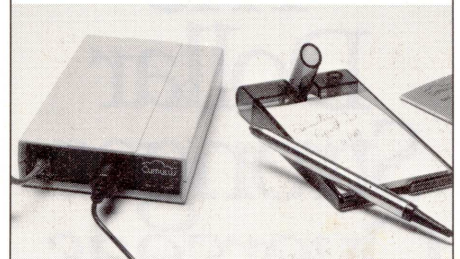
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panel has a 16-character LCD, two status LEDs and six function keys.

We connected the L-25X-2 to the printer using the parallel cable Oak Grove supplied. At power up, the L-25X-2 goes through a series of internal tests. We printed a self-test page to test the interface between the L-25X-2 and the printer. The last connection was made between the L-25X-2 and the HP 3000 through an HP-IB cable.

Altogether, it took us less than 30 minutes to connect the the printer to the L-25X-2 and the L-25X-2 to our HP 3000. Configuring the software for the L-25X-2 and the HP 3000 took about an hour.

Print Documents, Create Forms

Following installation and setup, we proceeded to print a sample document. We created the document using EDIT/3000 and printed it using standard spooler commands.

The printer produced 375 pages in approximately five minutes. This works out to an average printing speed of 75 pages per minute.

After printing our own sample document, we installed Formmaker on our AST Premium/286 PC. Formmaker is an electronic forms software package that lets you design your own custom forms printable on the LZR-75.

Formmaker runs on IBM PC/ATs or compatibles, and requires 640K of RAM, a hard disk with at least 3 MB of free space, a 5 1/4-inch floppy drive, a mouse and MS-DOS Version 3.0 or higher.

Once the software is installed and Formmaker is running, you can start to create your form by selecting "1 - Forms Editor" from the main menu. A tutorial is included with the documentation that will have you designing your own custom forms in about an hour or less. We created a standard purchase order form.

Formmaker offers many options and features. For example, you can enter text and choose different font types for display, rotate text, draw boxes and lines, and create graphics, logos, and barcodes.

Forms that you create and save are in source file format. In order to print a form file on the LZR-75 printer, you

need to compile it with the Forms Compiler option in Formmaker.

After our form was created and compiled, we downloaded it from the PC to the HP 3000 using the file transfer option in Walker Richer & Quinn's Reflection 1. We then used the MPE command FCOPY to copy the file to the printer.

Documentation, Benefits, Etc.

The LZR-75 comes with an installation guide, a user's manual and a technical reference manual. The installation guide describes the major parts of the printer, the computer connection and electrical interface, and configuration and startup.

The user's manual is written for people who use the printer on a daily basis. It describes printer adjustments, routine maintenance, and basic troubleshooting procedures.

The technical reference manual is complete and covers all the basic features and functions of the printer. Detailed card component layouts and interconnect drawings are located in the appendix. Software-controlled functions are covered down to the byte level, and error codes are explained along with recommended corrective actions.

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► The LZR-75 Ion Page Printer produces 75 pages per minute in either portrait or landscape mode with a resolution of 240 X 240 dpi.

The LZR-75 Ion Page Printer interfaces with Wang 5577, HP256X, IBM 5224, IBM 5225, 5219, 4214, IBM Channel I/F.

You can create your own custom forms with Formmaker running on your PC. Then, download and store your forms in the printer's memory for future use.

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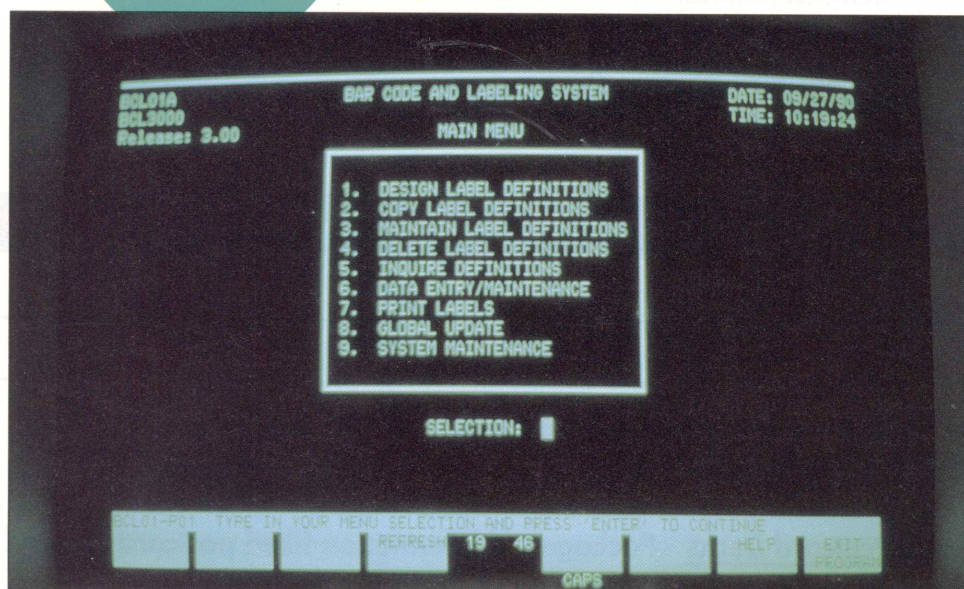
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Design Custom Bar-Coded Labels With QCI's BCL3000

You find bar codes on everything, from applesauce jars to zucchini bread wrappers. But they're not just limited to food packaging, bar codes make keyless data entry a real part of every day life.

You can create bar-coded labels on your HP 3000 with BCL3000 from Quality Consultants Inc. (Atlanta, GA). BCL3000 is software that lets you create and print bar-coded labels on a variety of printers.

Installing BCL3000

We installed BCL3000 on our HP 3000 Series 37 and created bar-coded labels. We printed the labels on an HP LaserJet Series II printer.

Installation was straightforward. The BCL3000 software came on a cartridge tape. From the MANAGER.SYS account, files are RESTORED from tape. To run

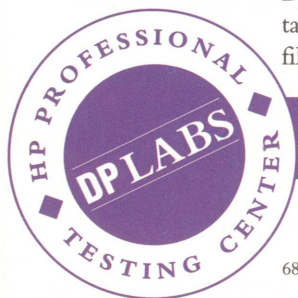
BCL3000, log in as MGR.-BCL3000,-PROD and then type BCL.

BCL3000 supports several printers including HP, Printronix and Prodigy printers. We connected our HP LaserJet Series II to the HP 3000 serially through an ATP port. Specific printer port configurations are listed in the User Guide.

The LaserJet Series II requires two font cartridges to print labels. QCI supplied HP 92286W1, (Bar Code 3-of-9 OCR-A) and HP 92286R (Presentations 1) for this review. Font installation programs are included with BCL3000. FONTW1.PUB installs the HP 92286W1 cartridge, and FONTR.PUB installs the HP 92286R cartridge.

Design Your Labels

To design a new label, QCI suggests you use an existing label for reference or



George T. Frueh

sketch your label on paper first. (Sample labels are provided with BCL3000).

When you first start BCL3000, the online menu appears. From this screen, you can design, copy or delete label definitions, enter data for a particular label, perform global updates and system maintenance, and print labels. BCL3000 has a demo guide that walks you through the design of a bar-coded label.

To design a new label definition, select option 1 from the online menu. Enter a name for the label definition in a field that appears at the bottom of the screen. The name assigned to a label definition should describe the label. We entered "NAMETAG" as the label name.

BCL3000 takes you through a series of screens where you enter all the information required to fully define a label. As you work through each screen, you can ask for help using F7. F3 lets you print the screen you're viewing, and F8 will exit the screen you're viewing.

Walking Through The Screens

The label design function leads to Label Information. In this field are the date and time when the label definition was created. You can enter comments to help identify the label definition.

Next is the data definition screen. This describes the format of each record in the data field. You can enter a descriptive name of up to eight characters or use an existing data definition. To look up an existing data definition, press F5 for BROWSE DATA DEFN. We entered "NT" as our data definition name.

Once the data definition is named, you can start filling in the fields, which are numbered and define the layout of the file. You can define up to 99 fields. To enter data into a field, type the field name next to a field number, the type of field it is—"T" for text, "N" for numeric, or "Z" for zero-suppressed, and then the length of the field.

The next two screens of the label design function are printer definition screens. The first screen allows you to select a printer ID, and the second lets you specify printer options for your label.

BCL3000 comes with five default

printer IDs. As when defining data definitions, the F5 key will look up existing printer IDs. We used BCL3000's default printer ID, PRINTER4. This ID equates to the LaserJet Series II printer.

After creating a printer definition, you must create a form definition. The form definition describes the physical dimensions of the label. These include top, bottom, left and right margins, page size and number of labels down and across the page. You start by assigning a name to the form definition to be used with your label. You can create your own or look up existing form definitions.

We created and named our form definition LP-2X4. Dimensions included a top and bottom margin of .50 inches, and a left and right margin of .25 inches. The number of labels down was five, and across was two. These dimensions let us produce a total of 10 2 by 4-inch labels on an 8 1/2 by 11-inch sheet of paper or label stock.

Following the Form Definition screen is the Create Label Format Definition

► You can design your own BCL3000 bar-coded label in three easy steps.

1. Define data file layout.
2. Design label format.
3. Specify output device.

BCL3000

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screen. This screen displays 36 input fields. In our example, we filled only the first three fields with — NAME, DEPT, NUMBER.

Along the bottom half of the screen are fields that fully define each line of output on the label. For example, the Label Vert Postn (Label Vertical Position) field specifies the distance in inches from the top of the label to the starting point where the field is to print. The Label Horz Postn field specifies the distance in inches from the left edge of the label to the starting point where the field is to print.

Other fields include selecting the font cartridge ID to be used, the font ID of the selected cartridge and the height of a bar code, if one is to be produced. Once all fields are filled in, you can generate a printout using F6.

Enter Your Data

Once the data definition format for our label was specified, we built a data file using the Data Entry/Maintenance function.

This function lets you create and name a label data file using the data definition format specified for your label. For example, our label NAMETAG with data definition format NT required a NAME, DEPT and NUMBER to be entered for each label printed. We named this data file "EMPDATA" and then entered 10 fictitious names, department names and department numbers.

Print Your Bar-Coded Label

To print labels, select Print Labels from the online menu. You're prompted for the label name, data definition name and data file to be used in generating your labels. In our sample labels, we specified NAMETAG for the label, NT2 for the data definition name, and EMPDATA for the data file.

BCL3000's menu-driven screens make creating your own bar-coded labels fast and easy. Working through the screens to design a bar-code layout takes little time to learn. With the help of the demo guide, you'll be designing your own bar-coded labels in no time at all. ■



HP-UX

Andy Feibus

Configuring X Clients

Besides configuring the X Window manager (the program that controls how windows appear and act), X configuration is primarily performed by creating and tailoring the file `.Xdefaults` (in your home directory).

`.Xdefaults` is a text file where you specify the values for different *resources* used by each X client you can run. In essence, a resource is a configuration option. X clients, when run, automatically read this file to obtain the settings you want for the resources recognized by the program. Any resources you don't specify in `.Xdefaults` assume their default values.

A value is specified for a resource by including a line within `.Xdefaults`. This line contains the name of the resource followed by a colon, at least one space or tab, and then the value for the resource. For example, to specify that you want to (by default) display the digital version of **xclock** (the X timepiece), include the following line in `.Xdefaults`:

```
xclock*analog: False
```

In this example, the `analog` resource for the **xclock** program is set to `False` (indicating that the clock should show a digital display). In general, most client resources can be set using the form shown by the above example. Other examples:

```
hpterm*foreground: black
hpterm*background: white
hpterm*geometry: 80x24
xclock*hands: LimeGreen
xclock*foreground: black
```

The first three lines set the color and the size (in characters) for the HP termi-

nal emulator's window. The last two lines set the color of the X clock's hands and tic marks (in analog mode). I'll discuss specifying colors later.

Some X clients are comprised of multiple windows, known as *widgets*. Widgets act in a particular manner, for example, a scroll bar widget (like the one in **hpterm**) provides a sliding bar and arrows. You move the sliding bar by selecting the arrows or by dragging the bar.

Widgets operate together or separately to orchestrate the X application. With a scroll bar, for example, moving the sliding bar (either by dragging the bar or by selecting the arrows) changes the text viewed in the terminal window.

You should refer to the manual reference page for the particular X client to obtain the names for the widgets created for the program. The name for the scroll bar widget used by **hpterm** is `scrollBar`. To change the color of the scroll bar, include the following line in `.Xdefaults`:

```
hpterm*scrollBar*foreground: LightBlue
```

To specify a default value for a resource that is common to many clients, use the following syntax:

```
*resource: value
```

For example, to specify a default foreground color for all clients (without an otherwise-specified color), include the following line in `.Xdefaults`:

```
*foreground: DarkGreen
```

These default resource values are used only if a specific resource value is not otherwise assigned in `.Xdefaults`. In other words, assigning a color for `scrollBar*foreground` overrides the color you specify for `*foreground`, but only for `scrollBar` widgets or clients.

In some clients, widgets are created hierarchically. For example, a client created with the Motif widget set can have a main window widget that contains a menu bar widget that, subsequently, contains a set of push button widgets.

For hierarchical widgets, you can specify resource specifications in one of two ways:

- Tight bindings (represented by a `.`).
- Loose bindings (represented by a `*`).

Tight binding means that the names on both sides of the `.` must be next to one another in the widget hierarchy. Loose binding means that any number of levels in the widget hierarchy may come between the names on both sides of the `*`.

For example, to specify the fore-

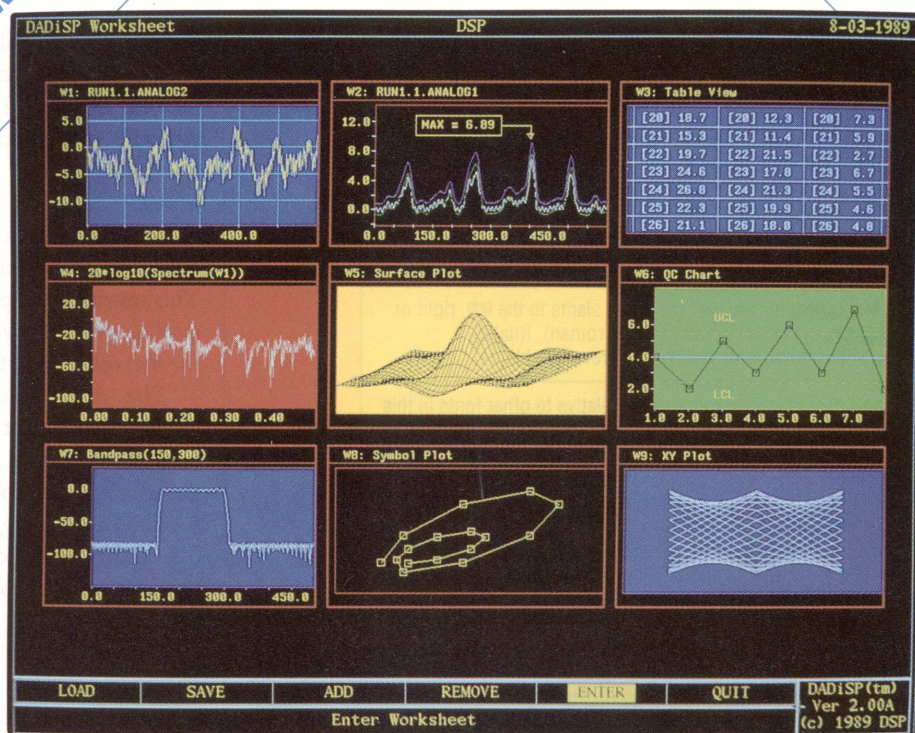
TABLE 1	
foreground	The foreground color (default is black).
background	The background color (default is white).
borderColor	The color for the window/widget border (default is black).
borderWidth	The width (in pixels) for the window/widget border (default is 1).

Window and widget resources.

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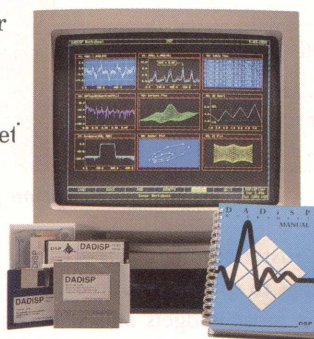
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CIRCLE 110 ON READER CARD

TABLE

2

Foundry	The name of the font designer.
Font Family	The commercial name of the font.
Weight	The relative weight of the font; for example, bold.
Slant	A code indicating whether the string slants to the left, right or not at all. The possible values are R(roman), I(italic), O(oblique), RI(reverse italic) or RO(reverse oblique).
Width	A code describing the font's width relative to other fonts in this family. Typical widths include normal, condensed, narrow, and double-width.
Style Name	A string used to further uniquely reference a font. In most instances, use * in this field.
Pixels	The size of the font in pixels. Fonts are normally measured in <i>points</i> , which are 1/72 of an inch. The number of pixels in a font's character depends on the resolution of the font. If the font has 100 dpi resolution, a 12-point font has a pixel size of 17.
Points	The size of the font in tenths of a point. A 10-point font is specified as 100.
Horizontal Resolution	The resolution for the font in the horizontal direction. Most X fonts are either 100 dpi or 75 dpi; this value is specified in dots-per-inch.
Vertical Resolution	The resolution for the font in the vertical direction. As with the horizontal resolution, this value is specified in dots-per-inch.
Spacing	A code indicating the spacing between units in the font. The possible codes are M (mono-space or fixed pitch fonts), P (proportional fonts), or C (character cell fonts; used mostly for graphics symbol fonts).
Average Width	The average width, in tenths of a pixel, of the characters in the font.
Registry	The standards organization registering the font. This string is usually iso8859.
Character Set	The string identifying the character set to the standards registry; for example, roman8.

Font string description fields.

ground color for all widgets comprising the **hpterm** client, use:

```
hpterm*foreground: orange
```

However, to specify the foreground color for just the scroll bar widget, use:

```
hpterm.scrollBar.foreground:MediumVioletRed
```

Using tight binding implies a special knowledge of the widget hierarchy; in

most instances, you should use loose bindings to specify resource values.

For most widgets and windows, the resources in *Table 1* are defined.

In general, the value for each resource is either a Boolean (True or False), a numerical value (e.g., 120), or a string (black). Two special string values you'll specify are *colors* and *fonts*.

Colors

As you may have noticed, the value for color-based resources can be specified by

the name of the color you choose to use. Names and definitions for all colors are stored in the file **/usr/lib/X11/rgb.txt.**, which you can view using the **more** command. A portion of this file is in *List 1*.

To specify a color string, you must exactly match the color's spelling as listed. This restriction explains why colors containing multiple words are specified (in the file) using more than one capitalization.

The three numbers on each line specify the amount of the primary colors (red, green, and blue, respectively) comprising the color. Each number is specified as an integer between 0 and 255; 0 indicates that none of the particular primary color is included in the color's composition.

For example, black is the absence of all color, so black is specified as **0 0 0**; white contains the full amount of all three primary colors, so white is specified as **255 255 255**.

If you want to use a color not defined in this file, you can specify the exact color you want with a hexadecimal color specification. In general, you won't need to specify colors in this manner. If you do, refer to your X documentation for more information.

Fonts

A font is a type style in which text characters are printed. All fonts included with X are stored in files within the directory **/usr/lib/X11/fonts**. Font strings are specified as a series of font characteristics, separated by dashes. Any characteristic can be replaced by the ***** wildcard character to indicate that any font can match this portion of the font string.

The font string contains the fields (separated by dashes) found in *Table 2*.

An example font string specifying a bold, courier, oblique 10-point font on a 75 dpi display follows:

```
**-courier-bold-o-normal-***-100-75-75-***
```

You want to use this string as the value for the font for **hpterm**? Include

the following line in .Xdefaults:

```
hpterm*font: *-courier-bold-o-normal-**-
100-75-75-**-**-*
```

In general, if the particular font you want is available on the server, you should specify the font string with the fewest number of wildcards. If you don't need an exact match, use wildcards liberally; the server will use any font that matches your string.

Each subdirectory in `/usr/lib/X11/fonts` includes the file `fonts.dir`, which contains a list of the characteristics for

35	35	117	navy
35	35	117	Navy
114	159	255	sky blue
114	159	255	SkyBlue
126	136	171	slate blue
126	136	171	SlateBlue
84	112	170	steel blue
84	112	170	SteelBlue
255	114	86	coral
255	114	86	Coral
179	179	126	khaki
179	179	126	Khaki
255	135	0	orange
255	135	0	Orange

List 1.

```
*topShadowColor: White
*bottomShadowColor: Black
*activeTopShadowColor: white
*activeTopShadowPixmap:75_foreground
*activeBottomShadowColor: black
*activeBottomShadowPixmap:foreground
*backgroundPixmap: 50_foreground
hpterm*background: white
hpterm*cursorColor: Coral
hpterm*pointerColor: Coral
hpterm*scrollBar: TRUE
*font: *-Courier-normal-R-Normal
--*-140-**-**-iso8859-1
*boldFont: *-Courier-Bold-R-Normal
--*-140-**-**-iso8859-1
hpterm*flashBorder: FALSE
hpterm*borderColor: LightSteelBlue
*keyboardFocusPolicy: pointer
xclock*analog: true
xclock*hands: LimeGreen
xclock*highlight: navy
xload*foreground: LimeGreen
xterm*background: white
xterm*cursorColor: LimeGreen
*Background: white
*BorderColor: black
*Foreground: black
*shadowOn: true
```

List 2.

each font stored in the directory (each unique font is stored in a single file). Review these files for more information.

Putting It All Together

A portion of my .Xdefaults file is in List 2. Review your documentation for more

information about each X client referenced by this listing.—*Andy Feibus is an interplatform systems consultant, based in Atlanta, GA.*

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MANAGING YOUR HP 3000

John P. Burke

3000 editor. A frequent contributor to our From The Lab section, Burke has managed HP 3000 systems for more than 14 years. He currently works for Construction Computer Corporation, Philadelphia, PA. "Managing Your HP 3000" will appear bimonthly.

In 1990, one virtually unpublicized decision by HP sent shock waves through the HP 3000 community and left customers and ISVs reeling. For the first time since at least 1978, HP made it possible to purchase an HP 3000 computer without TurboIMAGE.

The uproar created by the "unbundling" of IMAGE resulted in national press coverage, and after a few rounds of posturing, threatening and name calling, nobody's position seemed reasonable. The supposedly sophisticated, multi-billion dollar Hewlett-Packard company was left looking like the rankest of marketing amateurs, and the HP 3000 user community looked like a pack of spoiled children. It wasn't exactly anyone's finest hour.

An Objective Assessment

Now that a few months have passed, I propose we look at HP's decision with some objective distance.

For many IMAGE devotees the term "unbundling" has a distinctly Orwellian ring. To them, it's as if HP were saying, "We're not getting rid of IMAGE, we're just not including it anymore." Such a position would be hypocritical indeed. But is it really the case?

There's no doubt that IMAGE's defenders make a strong and important case for their favorite product. If there were one single piece of software that could be

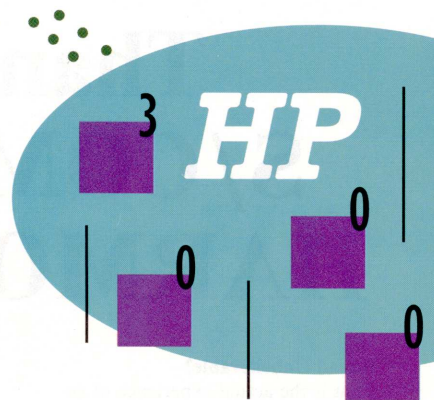
The Unbundling Of TurboIMAGE Boils Down To Smoke And Mirrors

Benchmarketing

Editor's note: HP Professional welcomes John Burke as HP

credited for the success of the HP 3000, it would have to be IMAGE.

The way I see it, HP either stupidly failed to anticipate the scope and intensity of users' reaction to the IMAGE decision, or it callously chose not to care. Without evidence of Machiavellian intent, I'll go with stupidity — which means there are probably some marketing MBAs at HP who should polish their resumes and keep a low profile.



HP handled the public relations of this decision with almost unbelievable lunkheadedness. But let's evaluate the wisdom of the decision by itself, leaving aside the communications issues. At bottom, unbundling IMAGE was actually a marketing trick that will have little affect on the installed base.

Unbundling On Its Own Terms

In its explanation of the unbundling decision, HP asks us to believe that many of its new HP 3000 prospects are planning to run only relational database applications on their machines. A benevolent organization like HP doesn't want to make these prospective customers pay for something they don't want or need. At the same time, omitting IMAGE from the price tag makes the advertised entry price to MPE XL more enticing to outsiders. The cheaper it looks, the more it garners

the attention of industry analysts—those race-track touts of American business.

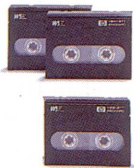
Realistically, can you imagine anyone hot for an RDBMS wanting to buy an MPE XL machine with ALLBASE/SQL? Of course not. Nothing is written for it yet. Plus, if you've been bitten by the industry bug *du jour* (i.e., standards and open systems) are you going to run out and buy a computer with a proprietary operating system? Again, of course not. You want an RDBMS? Then you probably want ORACLE, INGRES, etc. Better to buy a UNIX box or (horrors) even a VAX.

Let's look again at exactly what HP did with this decision. Customers now are allowed to *delete* TurboIMAGE from the price of a new HP 3000/9xx. Or, they can delete *both* TurboIMAGE and ALLBASE/SQL. (Conspicuously absent from the current price list is any option to buy TurboIMAGE at a later date. But that's a topic for another column.) Start to smell a room full of MBAs with dueling spreadsheets yet?

Sure, HP will sell you an HP 3000 without IMAGE. In fact, it'll sell you one without any database at all. It has to now, because it's on the corporate price list that way. But trust me, HP doesn't want to sell you a system without IMAGE and doesn't intend to.

What could you possibly do with an HP 3000 with no HP database anyway? You couldn't do much in 1990, and you won't be able to do much in 1991, either. Maybe several years down the road there will be meaningful third-party solutions. But today, you'd be crazy to buy an HP 3000 without IMAGE because you would be severely limiting your software options — to zero. Do you want to run Predictive Support? Forget it. How about NS? No way. OK, maybe a third-

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You get the picture. HP has become as used to having TurboIMAGE around as the independent software vendors (ISVs) and end users. It doesn't want to and isn't ready to deal with an IMAGE-less HP 3000. (I'm sure the sales force has a briefcase full of smooth arguments ready to cajole potential customers into *not* exercising the delete IMAGE option without admitting that they aren't ready to support such a configuration.) And, with the Wall Street sharks breathing down its neck, HP certainly doesn't want to give up all that extra IMAGE revenue anyway.

What exactly is going on here? If the installed base didn't want it, if potential customers couldn't use it, and if *Hewlett-Packard* doesn't want to do it, why *was* IMAGE unbundled from MPE XL? I believe the answer is simple.

The most likely explanation is that unbundling allowed the HP 3000 to achieve a low K\$/TPS figure in the TPC-A benchmark. In the arcane science of benchmarking, K\$/TPS stands for transactions per second per thousand dollars of total system cost. This rating is the primary weapon used in the price/performance marketing wars between OLTP computer vendors. You can forget about mips for the moment, TPC-A is where it's at.

You Are There

Now, here's what HP's MBAs were thinking: The HP 3000/9xx is sold with two databases bundled in, a relational database, ALLBASE/SQL and our old standby TurboIMAGE. TurboIMAGE has a higher TPS rating, but ALLBASE/SQL is still pretty good. Relational is *in*, especially on Wall Street — everything else isn't. The TPC-A benchmark requires only one DBMS.

Having arrived at this realization, the HP MBAs continued to scheme: TurboIMAGE obviously has a lot of value (\$45,000, or 15 percent of the base price on an HP 3000/950 sounds about right). However, ALLBASE/SQL doesn't have

much value because it isn't required for anything. If we subtract the value of TurboIMAGE from the system price and run the TPC-A benchmark using ALLBASE/SQL, we'll be able to beat DEC and IBM with our K\$/TPS.

At this point, incontestable logic had brought the MBAs to the brink of decision. They needed only to forge the enabling concept of "unbundling." Concluding arguments no doubt blazed to this ironclad resolution: Since the TPC-A test system has to be a configuration that can be purchased, we'll just say TurboIMAGE is a "delete option," publish it in the corporate price catalog, and away we go... Heck, it's all smoke. No one would actually want to buy a 9xx without TurboIMAGE.

Much Ado About Nothing

Like I said, it's simple. You can bet there were smug smiles all around about this one. That is, until the user responses hit the fan. Nothing gets a bigger reaction faster from a group of MIS people than a real or imagined slight of their pet language, computer, DBMS, etc. For some reason, Hewlett-Packard has been slow to recognize this basic axiom. Hence, the uproar.

Also, at the time when HP made the announcement, many HP 3000 users were beginning to believe that TurboIMAGE R&D was stagnant or non-existent. Most of HP's effort was being directed towards performance improvements and not toward the users' enhancement requests. Furthermore, this industry is so hopelessly faddish that if every other sentence doesn't mention SQL and relational technology, the vendor loses the sale.

My point is that people were already nervous about IMAGE. HP failed to recognize this and deal with it, and so, we had much ado about nothing while other important developments went almost unnoticed. For example, neglected in all the fuss was the announcement of the tight coupling of DISC's OMNIDEX and Bradmark's SUPERDEX with TurboIMAGE. This was big news folks! Does this mean we'll have Lotus-like add-ins

for TurboIMAGE?

Actually, in retrospect, unbundling may benefit IMAGE users more than we ever dreamed. If IMAGE is treated as a product separate from FOS, with its own support and maintenance costs, we might have better success getting some of the enhancements we've been requesting for many years. Whether you agree there's need for it or not, HP now is at least talking seriously about delivering the critical item update enhancement that seemed left to dry on the vine.

Times change and in this era, TurboIMAGE isn't the selling point it once was. What will probably happen in the next year or so is that HP will create (and bundle in with MPE XL) some kind of run-time version of TurboIMAGE. This way even if you don't want to develop your own IMAGE applications, you'll still be able to run HP and third-party software that uses TurboIMAGE. Probably there will be very few, if any, truly TurboIMAGE-less HP 3000s.

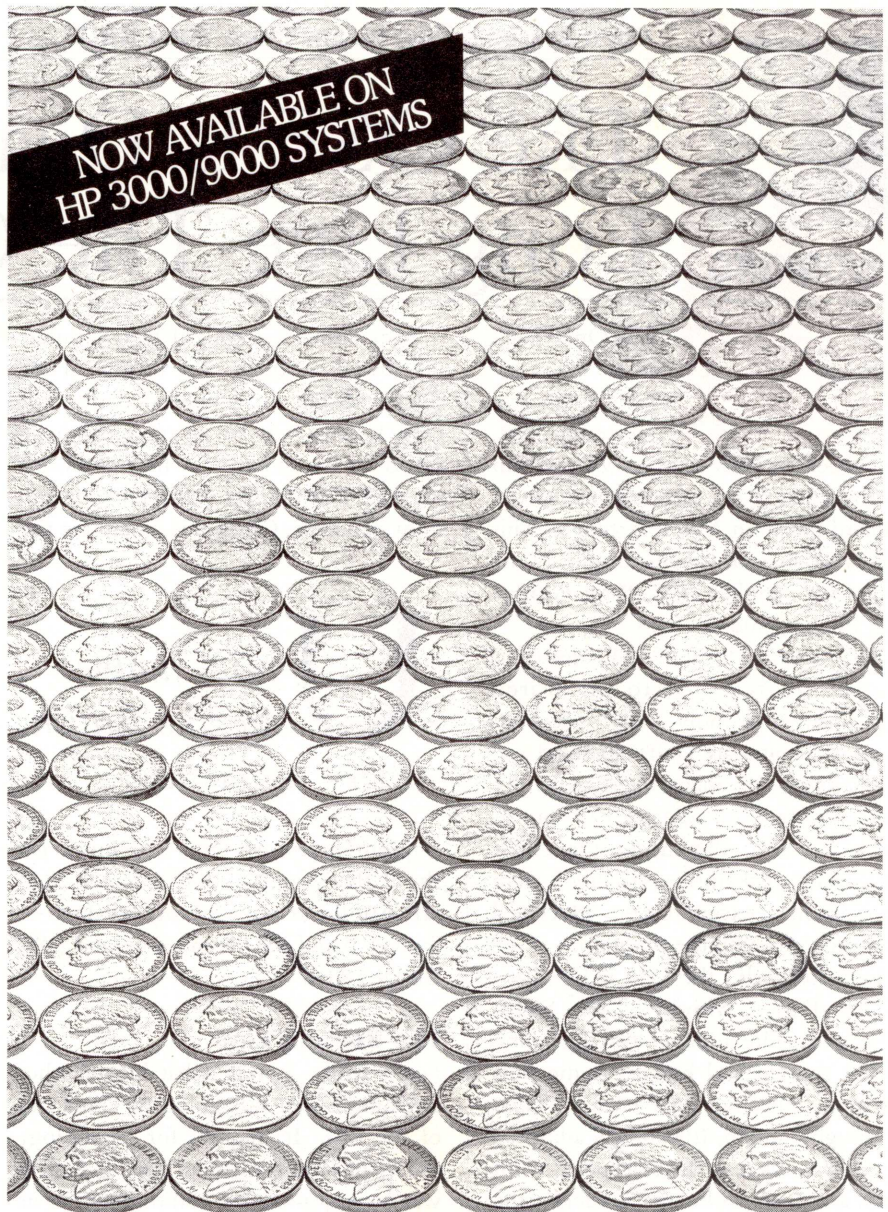
A Lesson To Be Learned?

The moral of this story? When you reduce marketing to so many spreadsheets, you're writing a prescription for disaster. Hewlett-Packard and the HP 3000 have many positive selling points. Price has never been one of them. Yet, by any standard, the HP 3000 has been a very successful computer system. Versatility, reliability, serviceability, usability — these really matter in the long run to the people using the systems.

Having blindly focused on the industry analyst crowd and their preoccupation with benchmarks and dollar signs, HP created an unnecessary furor among its installed base customers and with the third-party software vendors that have done so much to make the HP 3000 a success. This is a shame, because credibility lost can be difficult to regain.

But don't worry about TurboIMAGE, it will be around for a long time to come.

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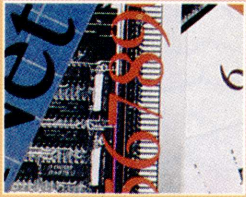
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NETWORKING

**Gordon
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Open Systems Now Means More Than UNIX

The OSF Is Dead! Long Live The OSF!

The Open Software Foundation (OSF) was created in 1988

to counter the alliance of AT&T and Sun Microsystems to create an ultimate UNIX standard based on AT&T System V. This unholy alliance of systems originally included HP, Apollo, DEC, IBM, Groupe Bull, Nixdorf and Siemens.

The original vision of OSF, created as a knee-jerk response to the feared AT&T/Sun monopoly, was to develop yet another ultimate UNIX standard and avoid paying too many royalties to the competition. Considering the rate at which Sun was gobbling up the UNIX workstation marketplace, this didn't seem like a bad idea, except to Sun, which still has a problem with the program.

Unfortunately, the OSF is like Operation Desert Shield in the Saudi wasteland: The idea of flexing some market muscle and kicking some butt was quite appealing—for a while. Then HP bought Apollo, IBM finally admitted that UNIX was real, the Europeans went crazy, and DEC woke up. Suddenly, the idea of real UNIX standards started scaring our not-so-altruistic friends in computer land, and the OSF spent more time fighting with itself than with the competition.

What vendors like about UNIX is that it seems like a standard, though it really isn't. Each can claim to have a standard operating system, but it doesn't have to run on any hardware but their own. The application software for it isn't easily portable if it does anything useful, like run graphics, for instance. C hackers can **awk** and **grep** to their heart's content in just about any of these UNIX versions, but that's about it.

The vendors in OSF couldn't give

a hoot about a standard UNIX unless it's based on their own version. They finally settled on a neutral design for OSF/1, which is based on something called the Mach kernel, which conforms to IEEE POSIX and X/Open Consortium standards. Great, but where are the

UNIX junkies
*are like British
sports car addicts...*

implementations? OSF/1 is more for show than for go. IBM still has AIX, HP Apollo is still selling HP-UX — System V and BSD versions — and DEC has ULTRIX.

The Bottom Line

For a while, it was debatable whether anything useful was going to come out of the OSF. Its request for technology (RFT) process was under fire, and there was no major-vendor commitment to its operating system. People began to wonder, "If the OSF can't come up with a version of UNIX that its members are actually going to sell, what's the whole point?" The OSF is still a bit defensive about this problem, but now it has an answer ready. And, it makes real good sense if you think about it.

First of all, UNIX isn't the central focus of OSF any more. After much deliberation, OSF decided that open systems doesn't have anything to do with UNIX per se. Realizing that arguing about the nits of operating system kernels was counter-productive and leading nowhere fast, the OSF decided to focus on system-independent issues. Open systems now means the Distributed Computing En-

vironment (DCE) and applications portability, not just UNIX.

The DCE architecture defines, among other things, presentation services (Motif), a distributed file system (the Andrews File System or AFS), remote procedure calls (based on the Apollo Network Computing System) and supports IEEE POSIX system calls and the X/Open directory systems and PC integration strategies. At the very lowest layer of the architecture, and separated by a very thick line, is the operating system itself.

This, I must say, is good sense, and shows the superiority of our capitalist system and good old-fashioned competition. Rather than arguing about UNIX, which in all of its flavors accounts for only about 10 percent (that's right) of the market, they have decided to think about the other 90 percent, where the real money is.

It doesn't matter what kind of operating system you use. As long as the programming interfaces are all there, you still can have interoperability and applications portability. Using the "driving a car" paradigm that gets beaten to death by the vendors: Who cares about the engine mechanicals? If you can find and use the steering wheel, gearshift and pedals, you're in business.

UNIX junkies are like British sports car addicts. They carry tools and spare parts in the trunk and fix it on the road. Most of us, though, want a more civilized ride. That's why we buy foam-padded, chrome-encrusted Detroit hardware and indestructible Japanese-mobiles. We don't all need the British sports car experience, and the refocusing of the OSF reflects the theory.

The name of the game is standardizing the application programming interfaces (APIs) to the operating systems, not

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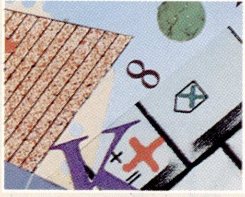
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PC TIPS

Miles B. Kehoe

It's hard to believe it's January. It seems like just a few

months ago I was looking into the crystal ball, wondering what 1990 would bring. Before I attempt to look ahead to 1991, let's look back and consider some big events of the past year.

One of the biggest events of the year, garnering a lion's share of fanfare and marketing hype, was the introduction of Windows 3.0. Not many companies have the influence to introduce an update to an existing program and pitch it as if it were a completely new concept. But Microsoft was able to pull it off and enjoy the kind of success some companies only dream about.

A closely related event of equal importance was HP's introduction of NewWave 3.0. When Microsoft announced Windows 3.0, HP announced that NewWave 3.0 would ship shortly thereafter, and the company was true to its word. In typical fashion, meeting an announced shipment date didn't qualify as big news at HP. Let's hope HP markets the program more aggressively than it hyped the announcement.

In 1990, the Intel 80486-based systems began to ship in volume, although most corporate buyers found that 386 systems featured better price/performance. Those same buyers watched closely as Microsoft and IBM first squabbled, then made up over the future of OS/2. In the end, Microsoft came down on the side of Windows 3.0, and IBM assumed responsibility for OS/2.

HP's Peripherals Group moved to increase its lead in the PC printer market with the introduction of the LaserJet IIP and the LaserJet III. Because more and more software is taking advantage of

Adobe's PostScript language, HP introduced a cartridge making PostScript available to many existing LaserJet owners and all new owners. HP also introduced DeskJet printers for Vectras and PCs, as well as for the Apple Macintosh,



and finally introduced non-water soluble ink. I wonder if anyone at HP notices that there is a correlation between the numbers of ads for a product and its sales? Its printers are certainly among its most heavily advertised products, and their sales reflect this fact.

A View To The Future

Now that we've reviewed the past, let's take a peek into the future. In the next few months, we'll see a new version of MS-DOS from Microsoft. Rumor has it that DOS 5.0 will include a much improved memory manager and that 640 KB will no longer be the memory limit.

DOS 5.0 also is rumored to include a QuickBASIC interpreter at the command level, so you can write scripts and batch files with a much more powerful interface. Throw in new commands such as UNDELETE and UNFORMAT, and it seems DOS finally may be gaining the features that power users have been wanting for years.

I'm sure that within a few months of the Microsoft introduction HP will introduce a better, more reliable version. The same will probably be true for OS/2 Version 2.0: Those of us who use HP equipment may have to wait for our software, but we can feel certain it will

be more reliable than what people buy "off the shelf."

OS/2 may have some surprises in store for us in 1991. Microsoft has announced that all current projects for OS/2 will be completed, but that the company will not actively develop on OS/2 in the future. Any software it decides to port will be written for Windows, then converted to OS/2 using Microsoft's toolkit to perform the conversion.

Speaking of OS/2, we may begin seeing software in volume for the promising challenger to MS-DOS. Microsoft Word for OS/2 is available, so can other leading applications be far behind? OS/2 Version 2.0 also will allow more than a single DOS session, testimony to the fact that if your system doesn't run DOS programs, it won't sit on many corporate desks.

Speaking of corporate desks, UNIX fans are hoping their favorite operating system will catch on in 1991. UNIX, especially its Hewlett-Packard incarnation, HP-UX, has gained a great deal of momentum in the last year or two. But I'm afraid it still has a ways to go before real people can use it. In the 386 world, more people are beginning to use UNIX, but I think that's mainly because they can run multiple MS-DOS sessions without too much difficulty.

The X interface offers some promise for UNIX and HP-UX, but until I can go down to my local software store and buy a utility or game for a price I can afford, I think I'll stick with MS-DOS. We'll have to see what OSF's Application Neutral Distribution Format (ANDF) can do to alleviate this situation.

Because UNIX is more of a religion than an operating system—and I don't want to offend anybody's beliefs, let me assure you that I do use UNIX almost

every day. In fact, thanks to NFS, I can use my HP 9000 Model 835 as a disk drive for my Vectra, and I really appreciate having the ability to back up my disk periodically with a simple XCOPY command. As far as I'm concerned, UNIX is great just where it is—hooked to the machine I work on via a long, thick, Ethernet cable.

Color My Words?

In the peripherals area, will we see a color laser printer from HP? Or, will HP stick with high-quality inkjet printers like the ColorJet to fill this market niche? Only time will tell.

One new capability we will see in 1991 is the ability to use outline fonts in Windows and most applications. Now, you need different font files for your screen and for each printer. These files take up a lot of disk space, and you can have a font on your system that isn't supported on your printer, or vice versa. Contrary to popular marketing hype, what you see is *not* always what you get.

Outline fonts, on the other hand, do not require that all sizes and fonts be stored on disk. Windows, for example, can generate any size of every font on your system and can display the characters on your screen, as well as on your printer. Further, you don't need to use disk space to store every possible size of each font: Again, Windows software can generate the font in real time. Postscript works this way now, but almost all fonts for use on your PC will work this way by January 1991.

One nice thing about trying to guess the future is that few of you will reread this column next December to catch my mistakes. On the other hand, if something I've mentioned does come to pass, there's a chance you'll remember hearing it here. Seems like a "no lose" situation to me. Be careful: Richard Bach says in *Illusions*, all of this may be wrong.—Miles B. Kehoe is an online support manager for Verity Inc., Mountain View, CA.

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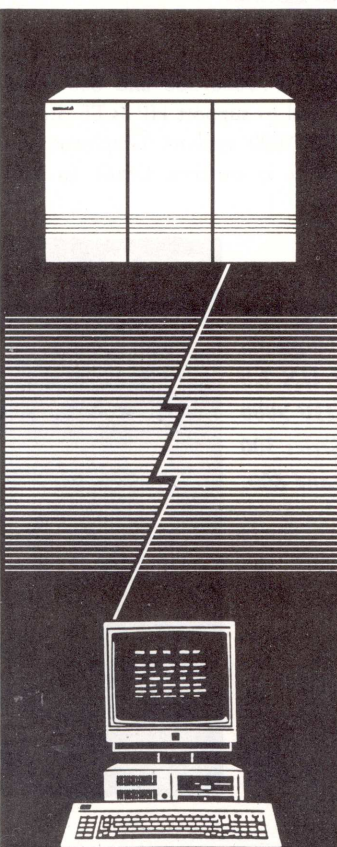
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CIRCLE 136 ON READER CARD



M.B. Foster Announces PCPOLL/3000

PCPOLL/3000, developed by M.B. Foster Associates, allows Reflection commands to be executed on a PC from the host. The PC can be directly connected or connected over a phone line. For example, the extensive power of Reflection command language can be used to upload and download files or check for the presence or absence of files.

Several customers are using PCPOLL/3000 to deliver files to local or remote PCs during the nightly batch processing run. These files include pricing tables, inventory files, and order information. Even output from a DataExpress procedure, creating a Lotus, Dbase, or WordPerfect merge file, can be downloaded to the PC. PCPOLL/3000 can now be part of your nightly processing as long as the PC is left on and Reflection is running.

The audit trail built into PCPOLL/3000 includes the complete logging of errors and retries that occur during the execution of the PCPOLL/3000 command file scripts.

This product requires Reflection 3.0 or later and version 5.22 of PCLINK or later. Any modem used must understand the Hayes-compatible AT command set.

PCPOLL/3000 version 3.0, scheduled for release this summer, is menu-driven. This version lets you define script files, users' PCs, connections, ports, or phone numbers by filling in the blanks in the menu. A complete inventory of the PCs to poll and the script files to run when polling can be displayed at any time.

Please call **1 (800) ANSWERS** or **(613) 448-2333** for additional information on PCPOLL/3000.



M.B. Foster Associates Limited

CIRCLE 155 ON READER CARD

U.S. Data Offers FactoryLink For HP-UX

U.S. Data Corp. now offers a version of its FactoryLink application enabler software program for HP's 9000 family of computer systems running under the HP-UX operating system.

The version gives users of HP 9000 Series 300 and 800 access to a library of FactoryLink application enabler programs available from U.S. Data and other software vendors. HP-UX users now can configure applications, without programming a wide range of real-time supervisory monitoring and control functions for manufacturing and process applications.

The FactoryLink software also permits HP-UX computers to integrate and access DOS, OS/2 and VMS-based factory automation and process control applications. HP system users benefit from the ability to exchange real-time data across applications and across platforms in a peer-to-peer architecture.

Contact John Schnert, U.S. Data Corp. 1551 Glenville Dr., Richardson, TX 75081-2418; (214) 680-9700.

Circle 368 on reader card

HP OpenView Runs On Sun Workstations

Hewlett-Packard introduced a version of the HP OpenView Network Management server software environment that runs on Sun Microsystems' workstations.

Previously available only on HP computers, the new product is part of the NewWave Computing strategy. Customers can create networks of computers that make computing resources easier to find, share, use and manage.

HP also announced five software enhancements that include the integration of existing HP-UX-based network and system management applications without additional programming; management of multivendor SNMP devices, including all non-standard Management Information Base variables, without additional programming; integration

of the HP LANProbe system under the HP OpenView network-management software environment; integration of SNMP information on HP OpenView Windows on the MS-DOS platform and availability of an SNMP-based agent for HP Apollo systems; and support of Microsoft Windows 3.0 technology for the HP OpenView Windows interface on the MS-DOS platform.

HP OpenView Network Management server software for Sun workstations that includes software to develop network-management applications and a single-user developer license is \$30,000. OpenView Network Management server end-user software for Sun workstations that includes software required to execute applications developed on a non-HP server and a single-user license is \$7,000.

Graphicus Updates Graft Graphics

Graphicus Inc. updated its Graft graphics development application to support HP-UX 7.0 on the HP 9000/300 and 800 series computers and to support HP RTE 5.2 on A-series HP 1000 systems. Graphicus also announced it is porting Graft to Sun

Microsystems' SPARCstations and SCO Xenix and OpenDesktop.

The Graft system supports development of graphical data display applications in a variety of windowing, terminal and hardcopy environments. It's suitable for developers who want to add graphics to new or existing software because it makes for easy prototyping of applications, provides fast integration tools and handles windowing and hardcopy requirements.

Contact Graphicus Inc., 150 Lake St. S., Ste. 206, Kirkland, WA 98033; (206) 828-4691.

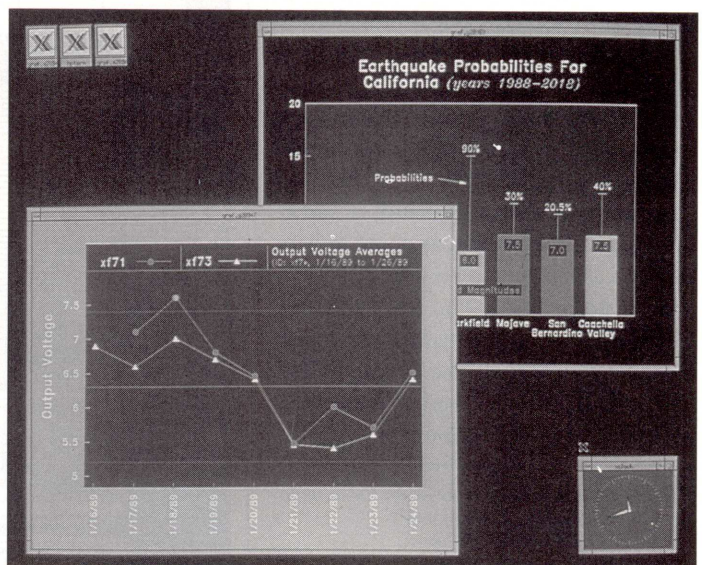
Circle 391 on reader card

DECADE-UX Features OSF/Motif Interface

CADSHARE Resources Inc. unveiled its OSF/Motif-based CAD/CAM Software Package DECADE-UX, a CAD/CAM package that features a Motif interface, based on X.11 Windows technology.

DECADE-UX is a 2-D/3-D design and drafting system for initial design, design modification and documentation of engineering projects. The software is portable between systems that support OSF/MOTIF. Systems currently supported by CADSHARE

Graft now supports HP-UX 7.0 on the HP 9000 Series 300 and 800.



Resources include HP 9000 Series 300/400/800 workstations, IBM RS/6000 workstations and Sony News workstations.

A single copy of DECADE-UX costs \$3,495. Discounts are available for multiuser installations and upgrades from other mechanical engineering packages. Contact CADSHARE Resources Inc., 9303-N. Monroe Rd., P.O. Box 11859, Charlotte, NC 28220-1859; (800) 633-7644.

Circle 400 on reader card

CUB UPS Line Improves Data Processing Productivity

Square D Company, Power Protection Systems, introduced a line of Topaz uninterruptible power system (UPS) products. Known as the CUB, the line provides inexpensive power conditioning and backup for computers and networks.

The CUB 250 protects 286 and 386 and other personal computers such as Apple Macintosh systems, against power failures. It allows up to 10 minutes of battery backup and reliable power protection for slightly more than the cost of a surge protector.

The CUB 350 provides protection and up to 10 minutes of backup power for high-end workstations or low-end file servers, and the CUB 550 provides protection and up to 10 minutes of back-up power for LANs, high-end file servers or multiuser workstations. The CUB 350 and 550 are available with network cabling and software options.

Contact Square D Company, PPS, 9192 Topaz Way, San Diego, CA 92123-1165; (619) 279-0111, ext. 555; (800) 344-0570.

Circle 397 on reader card

More Application Templates For PowerHouse/HP 3000 Users

Software Templates Inc. released three application templates for general ledger, sales and receivables, and human resources. The products are designed for users of COGNOS' PowerHouse 4GL and HP 3000 machines and meet essential functionality and data requirements for all types of businesses.

Like the currently available templates for

purchasing, inventory, payables, and fixed assets, the new modules enable novice and experienced PowerHouse users to develop complete custom solutions more quickly than starting from scratch.

The products are designed especially for PowerHouse, and a full development copy of PowerHouse is required. They include programming standards, structured code, QDD data dictionaries, normalized IMAGE databases, batch MPE import/export files and complete online documentation.

Application Templates work with the current version of PowerHouse under either MPE V or MPE XL. Source code site licenses start at \$4,500 per template, and there are multiple purchase discounts available. Product trials are also available for \$50.

Contact Software Templates Inc., Mapleshore, River Rd., P.O. Box 782, Manotick, Ontario, K0A 2N0; (613) 826-0226.

Circle 395 on reader card

MICR Checks Using HP LaserJet

Honickman & Associates (H&A) expanded its MICR product line to include a full range of related products and services including MICR fonts; MICR toner; a complete Integration Kit; Quality Control products and services; digitizing of logos, signatures and other graphics; consulting; Windows 3.0-based application software; check forms and form design services; and protocol converters.

MIS and system integrators now can take advantage of the benefits of MICR encoding using the HP LaserJet II, IID, III, IIID and other laser printers.

Contact Honickman & Associates, 185 Renfrew Dr., Markham, Ontario, Canada L3R 6G3; (416) 475-0402.

Circle 394 on reader card

Ryan McFarland Releases RM/PANELS

Ryan McFarland (RM) Corp. announced the release of RM/PANELS, a forms design and screen management system for developing easy-to-use interfaces for applications.

RM/PANELS requires version 5 of RM/COBOL-85 Ryan McFarland's development system. It will run on DOS and UNIX systems. Finished applications can be ported to other systems without modification.

RM/PANELS offers a WYSIWYG screen editor, panel-based field validation facilities, help screens and error messaging, ability to design applications using multiple panels, ability to establish "parent-child" relationships between panels as part of the design at runtime, facilities for panel layout prototyping, and a library manager to facilitate packaging of application-specific panels.

Contact Ryan McFarland Corp., 8911 Capital of Texas Hwy. N., Austin, TX 78759; (512) 343-1010.

Circle 389 on reader card

Alantec Supports SNMP On MLS System

Alantec announced support for SNMP with two new software products, MultiLAN Manager and SNMP agent software on the company's MLS internetworking system.

The MLS is a high performance multiport bridge that provides up to 40 Mbps sustained forwarding for as many as 10 Ethernet networks.

MultiLAN Manager is a network management software facility that allows for full management of MLS systems from UNIX-based SNMP managers.

The SNMP agent software on the MLS allows network administrators to monitor an MLS from centralized management stations in multivendor environments. Administrators can monitor MLS statistics and alarms, obtain basic MLS configuration data and enable or disable specific MLS ports from any SNMP management station.

MultiLAN Manager software for UNIX-based SNMP network management systems is available on tape and is priced at \$2,500. SNMP agent software will be standard on all MLS systems; it is offered free of charge on diskette to currently registered MLS owners. Contact Alantec, 101 Hammond Ave., Fremont, CA 94539; (415) 770-1050.

Circle 392 on reader card

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3094-10/90LC

NEW PRODUCTS

WRQ's Reflection Available In Windows 3.0 Version

Walker Richer & Quinn announced a new version of its Reflection terminal emulation software for Windows 3.0 operating environment. Reflection 1 for Windows takes full advantage of the memory management and multitasking features of Windows 3.0.

The Reflection host session functions like any other window on the desktop. It supplies pull-down menus and dialog boxes and works with both mouse and keyboard. It can be resized, moved and closed or shrunk into an icon.

Reflection is structured to make the most of the multitasking capabilities that the Windows environment offers. It runs in protected mode, so that it can avail itself of extra RAM, leaving room for large PC applications to run at the same time.

Reflection 1 for Windows provides host sessions over most LANS and other serial connections. It emulates the HP 2392A terminal and requires a 286, 386 or 486 IBM compatible PC running Windows.

Price is \$399 per single copy, quantity discounts, limited site licensing and server options available.

Contact WRQ, 2815 Eastlake Ave. East, Seattle, WA 98102; (206) 324-0350.

CIRCLE 393 ON READER CARD

HiBars Handles Archives And Storage

HI COMP introduced HiBars, (Hi Comp Backup Archival and Retrieval System) that works in conjunction with HI COMP's HiBack to handle archives and storage of large data masses in a network environment. With HiBars network backup can be both automated and unattended.

HiBars is a menu-driven user interface that enables backup managers to configure and schedule backup jobs for an entire LAN comprised of any combination of HP 3000, (MPE V, XL) and HP 9000 (300 and 800 Series) systems.

HiBars is used to describe and schedule any number of backup jobs for every node on the network and will automatically perform unattended backup for each requested machine as often as the schedule specifies.

Backups can be performed locally on each node or over the network to a backup device shared by several nodes.

HiBars uses HiBack in conjunction with NET-IPC to compress data locally before it's

transferred across the network to the target backup device. With HiBack, HiBars supports any device type including optical disk (autochanger or single drive), and 4mm and 8mm tape formats.

Contact HI COMP America, 588 Broadway, Suite 810, New York, NY 10012; (800) 323-8863.

CIRCLE 387 ON READER CARD

Iomega Enters UNIX Market

Iomega Corp. entered the UNIX market with Bernoulli technology for UNIX users.

Each Bernoulli disk can store 44 MB of application programs or data, making it practical for UNIX users to utilize their limited internal hard disks efficiently and access additional storage easily.

The Iomega Driver for UNIX is a package of three driver modules and two utilities that allow all Iomega former and present drives to operate in SCO UNIX System V/385 3.2 and AT&T's UNIX System V/386 3.2. The Driver operates with all members of Iomega's recently introduced Universal family.

The Driver for UNIX is available for \$99. Contact Iomega Corp., 1821 W. 4000 S., Roy, UT 84067; (801) 778-3345.

CIRCLE 399 ON READER CARD

Sedasis Offers Magneto-Optical Disk

Sedasis introduced a 650 MB magneto-optical disk that's supported under MPE V or MPE XL and offers direct access to stored information.

This unit is compatible with the HP Winchester disk, is interfaced in HP-IB and supports CS/80 protocol. This enables you to include the magneto-optical unit without any particular driver.

The SED6065 enables erasing and rewriting. Therefore, any recorded data can be erased without altering the support (guaranteed for 1 million cycles). For data recording, the SED 6065 uses 5 1/4-inch removable magneto-optical support with a total capacity of 650 MB.

You can use cartridges of 512 or 1024 byte per sector, the interface emulating blocks of 256 bytes per sector, standard format for HP 3000 machines.

Contact Sedasis, Le Vendome-12, Rue du Centre, 93167 Noisy Le Grand Cedex, France; (33) 1 45 92 3650.

CIRCLE 384 ON READER CARD

HP Unveils Three C++ Programming Advancements

HP introduced three new object-oriented programming advancements for the HP 9000 and Apollo platforms: HP C++ compiler on HP-UX, HP C++ Developer on Domain/OS and Domain/C++ 2.1.

These programming advancements add improved compile-time performance, simplified class construction and improved code modification, and support for the latest industry standard for C++, Version 2.1 from AT&T.

Engineers and programmers will be able to use HP's integrated C++ tool set to develop applications that address markets such as telecommunications, CAD/CAE engineering, user interface development, software development, graphics design and text management.

With the addition of the 2.1 version of C++ and HP's compiler solution for C++, HP has further enhanced the strong C++ offering across the Domain/OS and HP-UX platforms. The integrated tool set includes source code debugging, class library support, a class construction and browsing tool, a user interface management system and a development environment.

Applied Reasoning Offers 386 Upgrade Program

Applied Reasoning announced an upgrade program for owners of HP Apollo systems using the 80286-based Domain PC Coprocessor (DPCC). The program offers DPCC owners the PC-ELEVATOR 386, Applied Reasoning's 80386-based PC coprocessor, at a reduced price.

PC-ELEVATOR 386 is an expansion board that puts the power of an Intel 80386 processor in a UNIX workstation. Users can run any standard PC application in a resizable DOS window. The PC-ELEVATOR 386 supports all PC graphics standards (VGA, EGA, CGA and Hercules). PC applications can also directly access the workstation's graphics facilities for increased performance and full-screen 1280 x 1024 resolution. UNIX access allows for support of all workstation peripherals, such as mouse, keyboard, floppy, hard disk and network communications.

With 1 MB of 32-bit RAM, PC-ELEVATOR is priced at \$1,900. Under the upgrade program, the price is reduced to \$995. Contact Applied Reasoning, 86A Sherman St., Cambridge, MA 02140; (617) 492-0700.

Circle 381 on reader card

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Infotek Announces Mass Storage Peripherals

Infotek Systems announced a line of mass storage peripherals for HP workstations. The Infotek Systems MS Series disk drives combine fast access times, high capacity and an industry standard SCSI interface.

The MS Series drives are enclosed in a double height cabinet. Formatting sizes are 332, 664, and 1,000 MB and can be used in any combination. Infotek offers a 150,000 hour MTBF (mean-time between failures) rating and a five-year warranty.

Contact Infotek Systems, 1045 S. East St., Anaheim, CA 92805; (714) 956-9300; (800) 227-0218; in CA, (800) 523-1682.

Circle 380 on reader card

Thomas Knauf Offers ID-Module For HP 9000

Thomas Knauf introduced the SYSKOMP-ID-BOX, which simplifies the use of protected software for your HP 9000 workstation.

With the SYSCOMP-ID-BOX, programs limited to operation with an HP46084A ID-

module, may now be used. Instead of a single unalterable serial number, up to 24 freely selectable numbers are available. Software houses are provided with improved testing possibilities by being able to enter the serial numbers of end-users into their development systems and thereby to exactly replicate the configuration of the target-system.

With the SYSKOMP-ID-BOX, you can continue to work even in the event of loss or non-function of the HP Module.

The BOX replaces the usual HP46084A-ID-module and is connected directly to the HP-HIL interface of the processing unit.

Price is \$1,500.

Contact Thomas Knauf GmbH, Richard-Strauss-Ring 41, D-2400 Lubeck 1, Germany; (49) 451 476297.

Circle 382 on reader card

UniPress Releases Q-Calc RealTime 1.5

UniPress Software released Q-Calc RealTime Spreadsheet Version 1.5. New features include dynamic stock selection from within the spreadsheet, SQL access to Sybase and other

databases, data export to other applications and a timed recompute option for CPU-intensive real-time analysis conditions.

These new features ease integration with databases, statistical analysis programs and graphics for the UNIX-based real-time trader workstations increasingly used on Wall Street and elsewhere in the securities industry.

UniPress Q-Calc RealTime is a spreadsheet for UNIX/Xenix operating systems that combines powerful UNIX features with Lotus 1-2-3 file and macro compatibility. Financial users can link the Q-Calc RealTime Spreadsheet to Telerate, Reuters and other real-time datafeeds, providing automatic monitoring, analysis and alert messages.

Priced from \$1,995, with the Graphics module and Sybase option priced at an additional \$495 each, Q-Calc RealTime Spreadsheet is available for most UNIX computers, including the HP 9000/300 Series workstation. Source code is also available from UniPress.

Contact UniPress Software, 2025 Lincoln Hwy., Edison, NJ 08817; (201) 985-8000.

Circle 377 on reader card

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- Interoperability
- MPE, MPE-XL
- HP-UX
- MS-DOS
- OS-2
- Colour
- Windows
- SQL

CIRCLE 156 ON READER CARD

GSS' GDT Supports UNIX Platform

Graphic Software Systems (GSS), a subsidiary of Spectragraphics, released its new Graphics Development Toolkit (GDT) for UNIX in the INTERACTIVE 386/IX environment.

GSS' UNIX GDT supports display devices through an X Window System driver and also offers a variety of hardcopy device support. GSS' DOS GDT, OS/2 GDT and UNIX GDT are source code compatible. Applications developed with one can be relinked using the other to operate in any of the environments.

UNIX GDT is available for \$995 and comes in 3 1/2-inch or 5 1/4-inch disk formats.

Contact Graphic Software Systems Inc., 9590 SW Gemini Dr., Beaverton, OR 97005; (503) 641-2200.

Circle 388 on reader card

HP Announces Two 3 1/2-inch DAT Drives

Hewlett-Packard, co-developer with Sony Corp. of the digital data storage (DDS) format for digital audio tape (DAT), today marked its entry into the 3 1/2-inch computer DAT market with the announcement of two products that offer enhanced data compression.

The HP 35480A and the HP 35470A tape drives feature a 3 1/2-inch form factor and, a builtin SCSI II controller. The units are targeted at OEMs and system integrators. The HP 35480A tape drive offers up to 8 GB of data storage on a single cassette and up to 732 KBs data-transfer rate. The 35470A features a 2 GB storage capacity on one cassette. The HP 35480A is priced under \$1,600; the HP 35470A is priced under \$1,200 in OEM quantities.

LeeTech's DBA+I Controls ALLBASE/SQL Databases

LeeTech Software introduced DBA+1, a database management tool specifically for HP ALLBASE/SQL on MPE XL.

With DBA+1, database administrators, system managers and programmers have an integrated set of tools to manage and control their ALLBASE/SQL database.

Using a set of commands, you can perform multiple operations, to enhance database performance, to rename a database, to copy a database, to move table and related indexes from one DBEFileSet to another, to enlarge DBEFileSet capacity to update statistics for all tables and many more.

A set of dynamic database X-ray reports

can be produced online or in batch. With the wildcard search capability, users may view the summary and details about the database usage with percentage full for each DBEFileSet, database physical and logical structure layouts, performance evaluations, security definitions, access authorizations, index relationships along with other useful information for routine database administration.

A complete online help and built-in HP ALLBASE/SQL integrity and structure analyzer are provided to prevent any operational errors.

DBA+1 is priced from \$3,500 to \$8,000 depending on machine configuration.

Contact LeeTech Software Inc. 20380 Town Center Ln., Suite 240, Cupertino, CA 95014; (408) 253-1987.

Circle 385 on reader card

Cumulus Offers Bar Code Reader

Cumulus Technology announced a Bar Code Reader designed to work with either model HCT or CET display terminals. The bar code reader connects in series with the keyboard cable and is powered by the terminal. Terminator characters can be set by dip switch codes to indicate correct readings. Data can be entered on the terminal by using either the bar code reader or the keyboard interchangeably. The model 55 autodiscriminates 12 standard bar code formats.

Contact Cumulus Technology, 1007 Elwell Court, Palo Alto, CA 94303; (415) 960-1200.

Circle 383 on reader card

Kelly Memory Available For HP 3000 Series 980

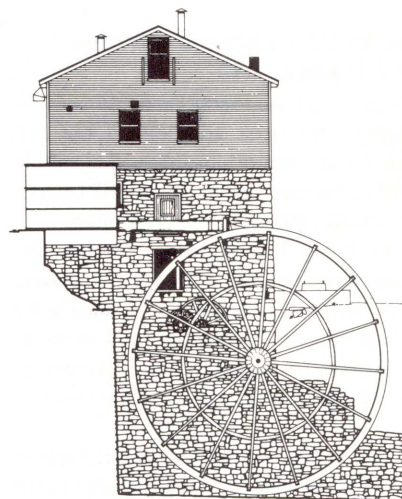
Kelly Computer Systems announced its 64-MB add-in memory arrays for the HP 3000 Series 980.

Kelly's Model 3980S provides 64 MB of memory and is fully compatible with the Series 980. The memory subsystem uses 4 Mbit Nibble mode dynamic RAMs with an access time of 80 ns. System features such as single bit error correction, double bit error detection, memory error logging and battery backup are fully supported.

User features such as an online/offline convenience switch, online LED indicator and activity LED indicator are also included. Contact Kelly Computer System, 1101 San Antonio Rd., Mountain View, CA 94043; (415) 960-1010.

Circle 390 on reader card

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HP Professional

3094-10/90PC

New Pretty Faces Cartridge For HP LaserJets

HP introduced the Pretty Faces bitmap-font cartridge, the latest addition to the HP MasterType Library of bitmap fonts and scalable typefaces. The cartridge works with HP LaserJet IIID, III, IIP, IID and Series II printers.

The Pretty Faces cartridge features five decorate typefaces and one novelty typeface. The Pretty Faces font selection is suitable for special documents, such as fliers and overhead presentations. It is the first bitmap-font cartridge from HP that includes type sizes larger than 24 point.

The cartridge is \$195. AutoFont Support software is included with the cartridge and is available on 5 1/4-inch and 3 1/2-inch disks. AutoFont Support automatically creates the appropriate font drivers for use with specific software programs.

Network Research Resells HP LAN Interface Card

Network Research is reselling the HP 98171A Ethernet LAN Interface Card (LANIC) with its FUSION TCP/IP Network Software for HP BASIC or PASCAL.

HP contracted Network Research to port FUSION Network Software to the 9000 series 200 and 300 workstations, thereby providing a multivendor connectivity solution for BASIC and PASCAL users. FUSION gives HP 9000 series users file transfer and virtual terminal capability between their workstations and other systems on a TCP/IP network, such as DEC VAXs, IBM mainframes, UNIX workstations and PCs running XENIX and DOS.

The Application Program Interface (API), which is included with FUSION allows unattended BASIC or PASCAL workstations to automatically transfer files to other systems on a TCP/IP network. FUSION's API also provides access to a socket library which increases the portability of applications.

The hardware and software, including the Application Program Interface, is \$2,495. Contact Network Research, 2380 N. Rose Ave., Oxnard, CA 93030; (805) 485-2700.

Circle 398 on reader card

LC-6020 Printer Aimed At High-Volume Uses

Advanced Technologies International introduced the LC-6020, a 20-page-per-minute, high-performance laser printer with duplexing capability and a variety of printer and plotter emulations.

The LC-6020 laser printer is aimed at high-volume users in paper-intensive industries such as law, insurance, finance and CAD/CAM. It offers cost-saving duplexing and a 1,500-sheet input and output bin capacity.

Users have the option of simplex mode, using 4 MB of memory, or duplex mode, requiring 8 MB of memory. They also have the option of emulations that are resident on ATI's LC6000 controller, including HP LaserJet/500/2000, HP-GL (HP 7475/7550) and LN03 Plus.

The LC-6020 is available for \$15,995. Contact Advanced Technologies International Inc., 355 Sinclair-Frontage Rd., Milpitas, CA 95035; (408) 942-1780.

Circle 378 on reader card

Micro Focus COBOL/2 V1.2 Available For UNIX

Micro Focus announced Version 1.2 of the Micro Focus COBOL/2 compiler for UNIX. Micro Focus COBOL/2 V1.2 includes the Micro Focus COBOL/2 native code generating compiler and programmer productivity tools, including the MicroFocus ANIMATOR visual debugger, in a bundled system for the production and maintenance of powerful COBOL applications.

Micro Focus COBOL/2 V1.2 is available directly from Micro Focus for AT&T UNIX System V.4 and SCO UNIX operating systems on i80386 workstations. Micro Focus COBOL/2 V1.2 also will be available for other platforms from computer manufacturers who resell Micro Focus COBOL/2 products.

Version 1.2 features ISAM File Data Compression, ISAM File Key Compression, color support, CONTROL phase of ACCEPT/DISPLAY, support for wide terminals, support for attached printers, COBDATA environment variable support and more.

Contact Micro Focus Group, 26 West St., Newbury, Berkshire RG13 1JT, UK; (0635) 32646.

Circle 396 on reader card

Genasys Announces Genamap 4.2, Genacivil

Genasys introduced Genamap 4.2, its Geographic Information System (GIS). It offers an interactive menu development system, more powerful relational database access and new image display and management capability.

Genasys also introduced its civil engineering design software, Genacivil, which includes

survey, COGO, drafting, terrain modeling, road design, hydrology and sewer design.

Now individual users can run Genamap through application-tailored menus without learning the entire system. GENIUS, for GENamap Interactive User System, saves user training time by allows custom menu interfaces to be interactively designed for specific applications. GENIUS supports pulldown, pop-up and cascading menus, scroll and text entry windows, and buttons with the MOTIF look and feel.

Genamap now supports the ability to import scanned documents and maps, such as those in TIP format, and build an image database. Also included in the 4.2 release are enhancements to the buffer command, new data-descriptive pie chart and graduated circle graphics, a text option for placing text along a curve and a text-drag feature for easier text placement.

Genacivil is UNIX-based software, using the C language, and the user interface is based on X.11-Windows. The system can operate standalone, however, it is designed to integrate with GIS.

Contact Genasys, 2629 Redwing Rd., Ste. 330, Fort Collins, CO 80526; (303) 226-3283.

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Optimem Offers Worm Optical Disk Drives

Optimem introduced two 12-inch and 5 1/4-inch (WORM) write-once, read-many optical disk drives for use by multiple hosts on LANs running Sun's NFS.

Each drive contains a proprietary, low cost Network Optical Server (NOS) developed for Optimem by Symmetrical Technologies (Knoxville, TN). The combination hardware/firmware server enables data stored on optical disks to be accessed by any network user, regardless of host platform. No special programming or customization of applications is required.

Optimem's 4400NOS offers network users up to 4 GB of permanent data storage on 12-inch WORM optical disks. Optimem's 600NOS is a 5 1/4-inch WORM drive which can store up to 654 MB. Each device can be used with any system that supports Sun's NFS protocol, including low-end PCs and Macintosh computers; workstations for HP, Silicon Graphics and Sun; and larger departmental computers.

Contact Optimem, 297 N. Bernardo Ave., Mountain View CA 94043; (415) 961-1800.

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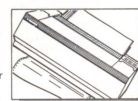
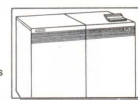
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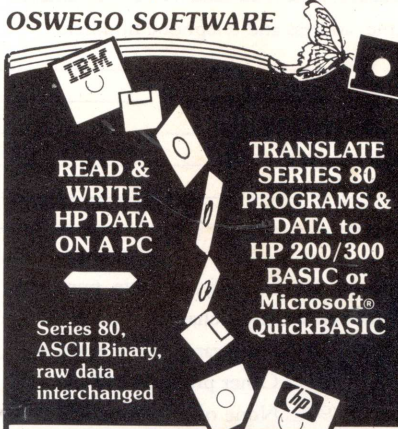
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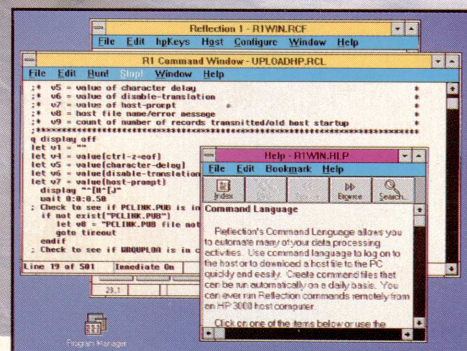
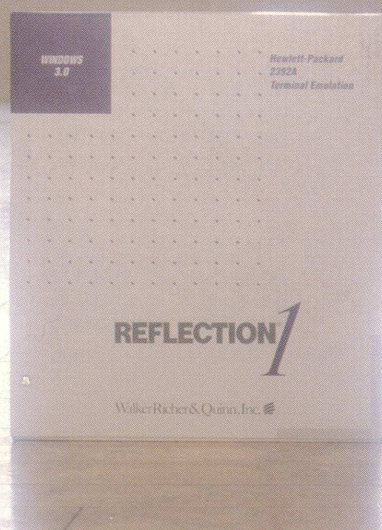
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